MLC-MB05

AN ANALYSIS OF THE EFFECTIVENESS OF AN INTERACTIVE, EDUCATIONAL GAME

A Interactive Qualifying Project Report:

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1. Education
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3. Stealth Learning

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Abstract

Previous studies have shown that an interactive tool tends to educate users better than a pure textual source. I wished to test whether these results hold for state budgeting, since this is generally regarded as uninteresting. If users could be motivated to learn about budgeting, they could be motivated to learn about many topics. A large user study with the previously-developed MassBalance game showed the interaction motivated students to spend more time learning, irrespective of their lack of interest in the topic.

Acknowledgements

I would like to thank my advisor, Professor Mark Claypool, for putting up with me with much more patience than I probably deserve. I would like to thank the MassBalance development team for creating the game I based much of this project on: Mike Gesner, Mark Smith, Eric Leshay, Mike Melson, Darren Torpey, Rhyland Klein, Randy Chong, Robert Patro, and all the rest. I would like to thank Vivien Yang and Moriah Knock for their moral support. Finally, I'd like to thank everyone that participated in the study.

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1 INTRODUCTION

Education is the foundation of a technological society. Each generation passes down its accumulated knowledge to the next. Each generation builds on this knowledge. As this knowledge base grows, it makes sense to apply it back upon the process of education itself— creating a positive feedback loop that can only result in the further advancement of technology. Without education, technology stagnates. Applying technology to education results in an interactive tool, the potential of which can far surpass that in books or other static sources of information. An education game can motivate the player into seeking their own answers, and reignite the joy of learning for its own sake.

There have been many budget simulation programs. A Google search for "budget simulation" returns many thousands of hits. However, I have not found any studies that compared these simulated situations to the real situations they purport to replace. Heffernan [10] and Brown [3] show, however, that motivation is a strong factor in learning. Additionally, these same studies show that interactive sources tend to increase the motivation of students to learn.

The goal of this study is to add evidence to the argument that interactivity results in better education with a carefully-designed user study. I compared a static text source against a interactive tool with a large set of possible win conditions. This interactive tool is MassBalance[11]. MassBalance is an interactive budget simulation tool written by members of the Infinity Complex development team, a team under the umbrella of the WPI Game Development Club. MassBalance was developed for the Massachusetts Senate, under the supervision of Senator Richard T. Moore. The goal of MassBalance is to "help educate the citizens of Massachusetts about the content and workings of their state budget."[1]

My study concentrates on the distinctions between interactive and static sources— specifically, MassBalance and web-based information copied from MassBalance. I so-

[1] Ibid

licited users to study a static source and an interactive source with exactly the same informational content. I asked that users spend ten minutes on their studying, but without enforcing this time in any way. When they were finished, I asked them to take a quiz to check information comprehension, and I asked them to answer several questions regarding their experience.

My findings tend to agree with the findings of the previous studies. The students appeared to learn the same amount of information from both the control and experimental sources. However, they tended to spend more time studying the interactive source. On average, they spent 20% longer than they were requested to, whereas the control users averaged 10% less time than they were asked. This shows that the Mass-Balance users were more engaged in their task than the control users.

In Chapter 2, I shall introduce background information necessary to proceed. I shall discuss games, and interactive learning versus static sources. I shall also give a brief background on the specific game I have chosen for this study. In Chapter 3, I shall then show how my information will be collected, and in Chapter 4 I shall share the results I deduce from this information. Finally, in Chapter 5, I shall show future educators techniques they can use to gain further information on this topic.

2 BACKGROUND

I shall first review several anecdotes and two studies related to my study, and then I will provide a history of the tool I have chosen to use for my experiment.

2.1 Games and Interactive Learning

Games are the most natural teaching tool. Before children enter classrooms and read books, they play with toys. Fails et al. [5] says that "The importance of play in young children's lives cannot be minimized. From teddy bears to blocks, children's experiences with the tools of play can impact their social, emotional, physical, and cognitive development." Human beings learn much while at play. But why are games so important? Why are they so effective? The answer lies in the verb itself. *Play* implies both a player and an opponent. The opponent can be another human, an imaginary friend, or even the player. When one plays solo basketball, they are competing against themselves. When a child arrives at the Castle Aaarrg, they are matching wits with the French Knight. In each of these cases, the player is interacting with another human, real or imagined. One cannot play without interaction.

Interactive tools help the user to learn. They motivate the player to form new questions and become personally responsible for the answers. Heffernan [10] developed an algebra tutoring system, "the Ms. Lindquist tutoring system," based on the Socratic method. He ran a controlled study to test his system, and the results "suggest that the tutor [they] built might be good, not because its leads to better learning in the same period of time, but rather because the dialogs help maintain student motivation[10]." A motivated learner will seek out knowledge to fill a need.

Static text sources, such as books, may not help to motivate the reader. They may even hurt the reader. If the reader is not motivated to maintain an internal Socratic dialog, they may begin to accept what they read without argument. Brown [3] believes

that an unmotivated learner will then see their lack of success as a failure of the system and not of the self, and will develop coping mechanisms that create a "formidable barrier to learning."

> "While having fun is not typically high on the list of teaching goals, its value should not be underestimated. Students who are having fun work harder, longer, and are more apt to expand on what is taught than those who simply wish to get it over with and pass the course[2]."

2.2 MassBalance

Figure 2.1: Screenshot of MassBalance

MassBalance was designed to help the Massachusetts voting public understand the magnitude of the budgeting problem. Most people cannot place a number like 4 billion dollars into context. MassBalance hopes to give the numbers context. Gesner

[8], project lead, says "If the game explains how much the price of milk or gas will go up as the result of a tax change you choose to make, it puts it in the hands of the player rather than asking the player to take on the role of a person that they are not familiar with."

MassBalance is an interactive budget simulation tool written by members of the Infinity Complex development team, a team under the umbrella of the WPI Game Development Club. MassBalance was developed for the Massachusetts Senate, under the supervision of Senator Richard T. Moore. The goal of MassBalance is to "help educate the citizens of Massachusetts about the content and workings of their state budget[11]." The player is presented with the state budget as it existed on July 1, 2003: with a $3.2 billion deficit. The data was provided by Senator Moore's Chief of Staff, and is accurate. So as to not completely overwhelm the player, the budget is simplified; line items are combined, and the number of categories is reduced. The player is free to add or subtract from any category or line item. However, if certain items drop below preset values, a warning appears about possible negative effects. One such warning is displayed in Figure 2.1 on the previous page. They are free to ignore the warning. However, when they declare the budget balanced, these warnings may mutate into real problems, such as riots or uncontrollable fires. The first release version of MassBalance can be seen at `http://www.playmassbalance.com`. The revision of MassBalance used in this study is not reliably available online. However, the only substantive difference between the revisions is an update of the user interface to make it work more reliably across different browsers, and does not affect the outcome of the study.

MassBalance is written in PHP4 using the Smarty Template Engine[1]. It also uses Javascript and DHTML for much of its interactivity. It works correctly on most modern browsers, such as Firefox, Internet Explorer 6, Konqueror, and Safari. It also maintains a moderate separation between the data and the code to aid in informational updates.

The information in MassBalance is organized into blocks. The blocks represent

[1] `http://smarty.php.net/`

general categories of the budget, such as “Assistance to Poor” or “Education and Children.” Each block is divided into several programs, such as “Medicaid” or “Housing Assistance” for the “Assistance to Poor” block. Each block and program entry has informational text attached to it which is displayed by clicking a question mark next to the entry. This informational text makes up the bulk of the control source. The balance of the control comes from the “Taxes” interface available through the navigation tool in the upper-left of the MassBalance user interface.

3 METHODOLOGY

MassBalance represents the interactive tool for the purposes of this study. However, to make the results have meaning, a control is also necessary. To create this control, the factual information was copied from MassBalance and organized into outline form in an HTML document. The text of this information was unchanged— only the format of the information was modified. The outline was decorated with a pleasing color scheme, but no additional changes were made to either source. I compared the effectiveness of these two sources of information by performing a user study. Each user was probabilistically assigned to a source, and I collected data from their interactions with that source.

3.1 Data Collection

The central script for data collection was `index.cgi` (Listing C.1 on page 47). A subject's path through the test was determined by this script. The script depended upon the Apache module mod_unique_id being loaded. "This module provides a magic token for each request which is guaranteed to be unique across 'all' requests under very specific conditions. The environment variable UNIQUE_ID is set to the identifier for each request[1]." This ID was passed as a parameter through the system to maintain a session.

`index.cgi` is a very simple state machine. In each state, it displayed a page to the subject and recorded specific data. While recording, the data was stored to a file named from the subject's ID. This ID was sanity-checked to insure that the subject was not attempting foul play.

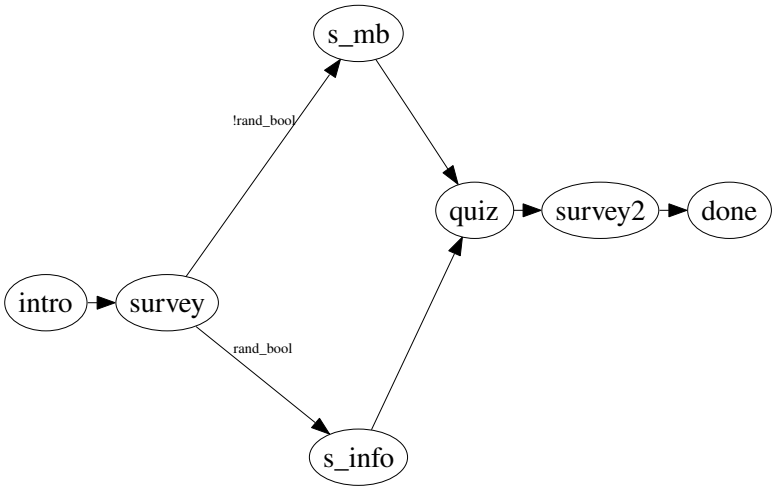


Figure 3.1: State machine for index.cgi

3.1.1 *intro*

When the subject first arrived, they were put into this state. A data file is created with the file name of their unique id. `intro.html` (Listing C.8) was displayed, and the subject's IP address and unique id were stored, along with the current time. The IP address was collected merely for abuse-detection. When he clicked "Start," the subject proceeded to the next state.

3.1.2 *survey*

In this state, the subject was asked to take a small survey, `survey.html` (Listing C.14 on page 96), to assess prior knowledge and to collect demographic information. The script randomly decided which source the subject will see. The current time and the source were recorded. When the subject clicked "Submit," he was taken to one of two possible states, depending on the script's chosen source.

3.1.3 *s_info*

`info-top.html` (Listing C.9 on page 65) was displayed, and the time was recorded. This page describes how the subject is to proceed, and (if his browser supports javascript) displays the time at which the experiment ends. When he clicked "Continue," the text

source was opened in a new window, leaving the instructions and time open. When he clicked "Done," he was taken to the *quiz* state.

3.1.4 *s_mb*

This state is much the same as the *s_info* state, except the `mb.html` (Listing C.12 on page 91) page was loaded, and he was shown MassBalance instead of the text source when he clicked "Continue."

3.1.5 *quiz*

In this state, the user was shown `quiz.html` (Listing C.13 on page 92). After he had completed the quiz, the user would push the "Submit" button and be taken to the next state.

3.1.6 *survey2*

When this state was loaded, it first saved the quiz data from the previous state. It did this by serializing the data with Data::Dumper. It came out in a single line, in a form that can be recreated by reading it. The user was then shown `survey2.html` (Listing C.15 on page 101). Upon completion of the post-survey and the user's selection of the "Submit" button, the user was taken to the next state.

3.1.7 *done*

First, the post-survey data was stored much as the quiz information was in the previous state. The "timedone" key was also created, to mark the session completed. Finally, `thanks.html` (Listing C.16 on page 103) was displayed to thank the user for his participation.

3.2 User Study

After the code was written, I began soliciting for users. In order to draw attention to my study, I wrote this email:

> Hello. We're doing a study on the effectiveness of games as teaching tools. We need your help- it's simple and should not take more than 20 minutes of your time.
>
> Participants in the study are entered into a drawing to win a $50 Best-Buy gift card.
>
> To help, just point your browser to http://www.fluffypenguin.org/iqp/ from any computer. To be entered in the drawing, you must complete the study by April 29.
>
> Thank you

I sent this email to quite a few campus mailing lists. I sent it to the undergraduate students list, the graduate students list, the computer science majors list, the computer science graduate student list, the Game Development Club announcement list, and my dorm list. I also sent the link to many of my friends. Unfortunately, the undergraduate, graduate, and computer science lists are all moderated. I sent requests to these list managers. The computer science list manager former posted my request to the list, but the other two failed to respond to prompting. My advisor applied pressure as well, to no avail. These lists are used for the most mundane of emails, but they do not seem to support the academic interests of the student body at all.

The emails went out on April 18, 2005. To finish the study before students went home for the summer, I initially had decided to end the study on April 29. However, the message to the computer science majors list was delayed; I extended the deadline to May 4, the end of the term. In total, the study lasted sixteen days.

To participate in the study, users pointed their browsers to `http://www.fluffypenguin.org/iqp/`, which was a Web server on my computer. On arrival, they were greeted with `index.cgi`, the operation of which is detailed in Section 3.1. The instructions on each page can be seen in Appendix A on page 27. After the user finished filling out the initial survey, the script randomly assigned a source, MassBalance or info, for the user. Initially, the probability of getting either source was fifty percent. However, approximately three-fourths of the way through the study, I noticed that the percentage

of MassBalance users had risen somewhat above that of the info users. I increased the probability of the info source, and the numbers balanced out by the end of the study.

The quiz was generated using `makequiz.pl` (Listing C.2 on page 49). The quiz questions were stored in an array of hash tables. When the script was run, it shuffled the array to randomize the order of the questions. It then printed each question and randomly scrambled the order of the answers. As it went over each question, it stored the correct answer in a key file. Finally, it generated a checksum that was stored in both the quiz and key files, to ensure that the key matched the quiz. This quiz was generated once and used for every user. The questions in the order they were presented can be seen in`text-quiz.txt` (Listing A.6 on page 39). The questions were also weighted individually for each source— some questions were more difficult with one source. The weights can be seen in in `quizdiff.pm` (Listing C.5 on page 60). The questions were chosen so the sum of all the weights for each source would be the same, and therefore the quizzes would be judged against the same max score. When the user got a question right, the weight was added to the user's total score while the total number of right answers was incremented. This data was collected and aggregated by the scripts in the next section.

3.3 Data Aggregation

Aggregating the large number of files generated by the previous step could have been a difficult process. To handle this data, I chose to maintain it as a Perl data structure. `dumpdata.pl` (Listing C.4 on page 58) created this structure. It read all the data files, skipping over the incomplete ones. It also loaded the quiz answers and used them to generate a quiz grade, which it then stored. It also deleted the subjects' email addresses from the structure. It then used the Perl module Data::Dumper to output the structure to a file in such a way as to allow it to be read back in and recreated in memory.

Finally, once the data is in one structure, it can be analyzed. To aid in this analysis, I wrote `drawgraph.pl` (Listing C.3 on page 53). The core of this rather ambitious

script was simple. It should load the data created by `dumpdata.pl` (Listing C.4 on page 58), and allow the user to pass function names, code, or set names in on the command line. It should then output a graph of this data in an easily-utilized format.

4 RESULTS

This section details my results. It discusses the collected demographic information, and then goes over the collected data in detail.

4.1 Demographic

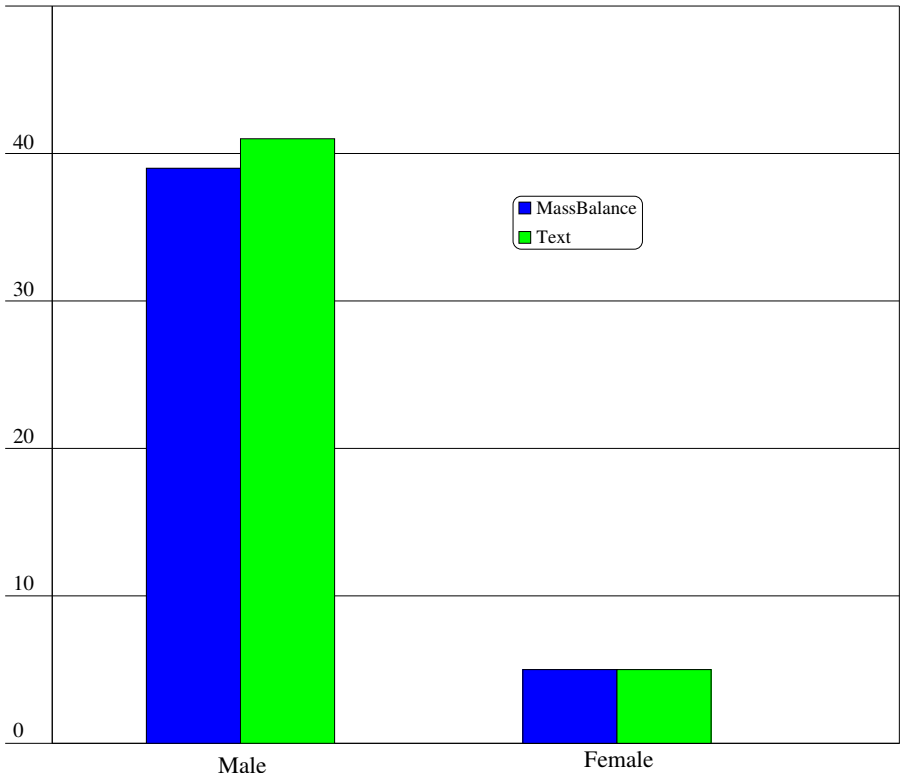


Figure 4.1: Gender breakdown

In total, 181 different data files were created. However, each of these data files cannot be considered as an attempt to participate in the study. Since a data file is created for each reload of the introduction page, many of the data files have to be removed. To ensure that only completed surveys are used, any survey without the “timedone” key are ignored. Since this key is created when the post-survey is submitted, only complete data files are used. Ninety data files met this burden. Of the ninety responses,

Category	Majors
Engineering	Electrical & Computer Engineering, Biomedical Engineering, Mechanical Engineering, Civil Engineering, Chemical Engineering
Humanities	IMGD, Humanities & Arts
Social Sciences	International Studies, Management Information System
Hard Science	Mathematical Sciences, Biology & Biotechnology, Physics, Chemistry
Computer Science	Computer Science

Table 4.1: Category breakdown for Figure 4.2 on the next page

eighty were male and ten were female. The genders were evenly divided between the two sources. Figure 4.1 on the preceding page shows this result.

Figure 4.2 on the next page shows the breakdown among academic majors. The categories are detailed in Table 4.1. The majority (approximately two-thirds) of the respondents are Computer Science majors. The reasons for this are detailed in Section 3.2. Generally, the reason for the imbalance is the computer science mailing list manager approved my message, whereas the undergraduate student and graduate student list managers did not. I publicized the study myself to the extent that I could, and the remaining one-third of respondents not of the Computer Science department can be attributed to this.

The pre-survey also contained several diagnostic questions. They were intended to assess the level of prior knowledge. The first question asked "How responsible are you for your own finances?" A "one" indicated "Not at all" and a "five" indicated "completely." The response can be seen in Figure 4.3(a) on page 16. The graph indicates that 59% of the text source respondents and 45% of the MassBalance source respondents answered with a four or a five. Even accounting for response inflation due to pride, this is not surprising considering that the vast majority of the respondents are college students. The graphs for each source are roughly the same, so this knowledge is unlikely to skew the result. Figure 4.3(b) on page 16 shows roughly the same rela-

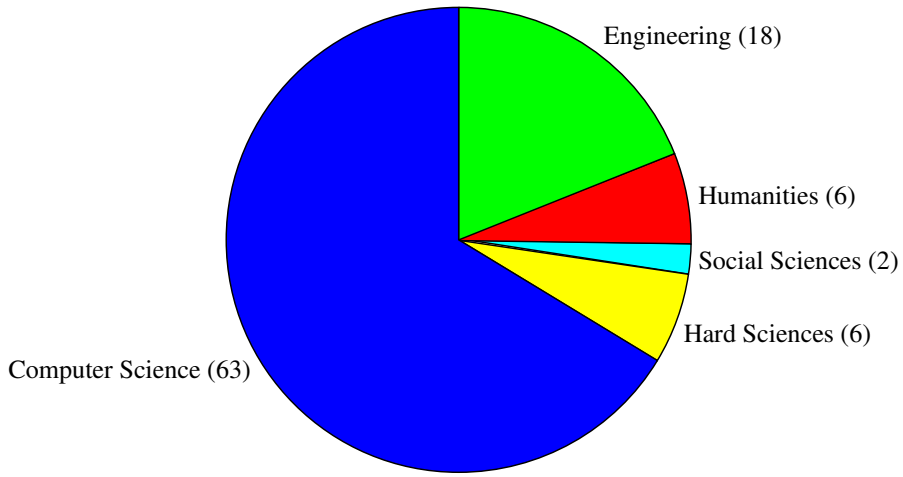


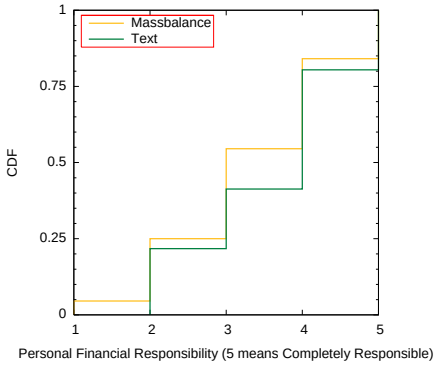
Figure 4.2: Major breakdown

tionship, with 50% of the MassBalance group and 60% of the text group reporting a four or five. The "government" in Figure 4.3(c) on the following page clearly increased the uncertainty in the question, since the percentages of fours or fives dropped to 20% for text and 7% for MassBalance.

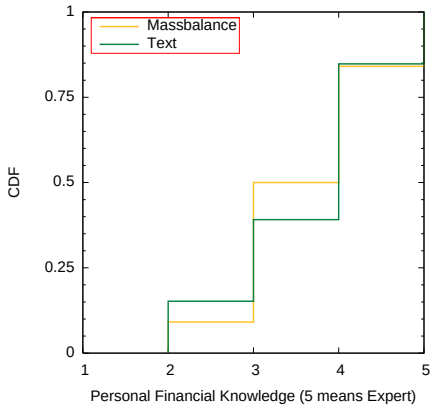
Two more diagnostic questions dealt specifically with games as teaching tools. The first asked "How often have you been exposed to games as learning tools in the past?" (Figure 4.3(d) on the next page). Both groups had a discrete uniform distribution, meaning any answer was equally as likely. The second question asked "How capable are you of learning from a game?" (Figure 4.3(e) on the following page). These answers show a strong "yes," with 75% of the text group and 60% of the MassBalance group answering with a three or better. Fully one-fourth of each group answered with a five. One of the respondents had an interesting comment related to these questions: "Every game is a learning tool."[1,2] The desire to win will cause a player to, consciously or unconsciously, improve their game. One of the more commonly-played games on many computers, Windows Solitaire, exercises logical decision making while appearing to be a mindless waste of time.

[1]Since this and other comments must necessarily remain anonymous, I will footnote them with their session ID.

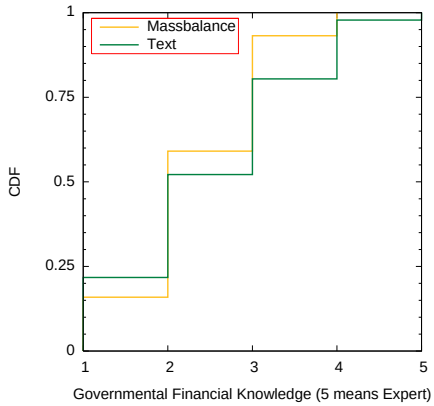
[2]QnWNWILX7yMAACv0CRQ



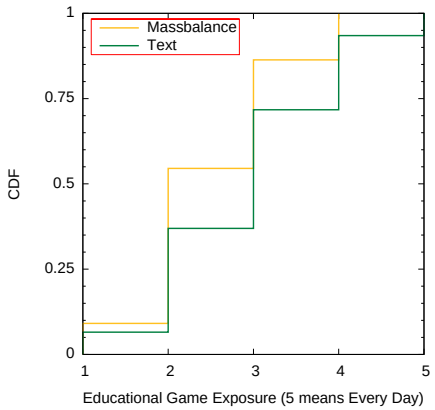
(a) "How responsible are you for your own finances?"



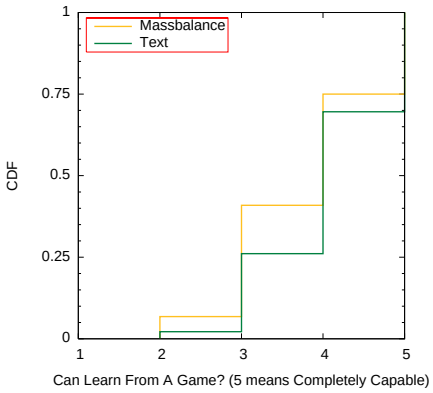
(b) "How knowledgeable are you about personal budgeting and finance?"



(c) "How knowledgeable are you about governmental budgeting and finance?"

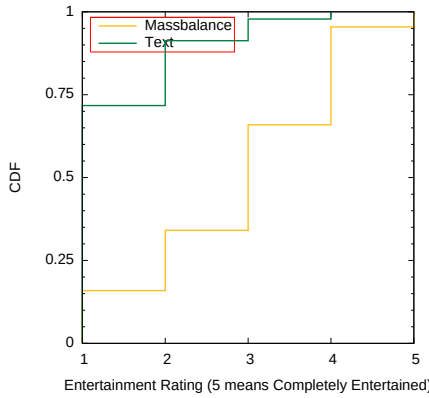


(d) "How often have you been exposed to games as learning tools in the past?"

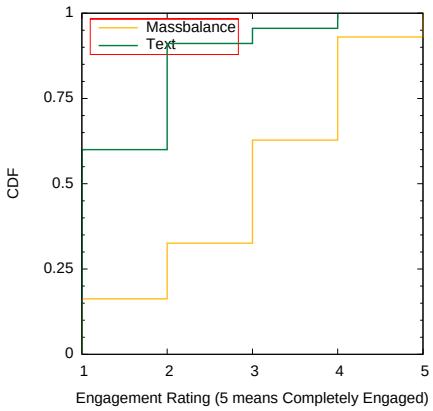


(e) "How capable are you of learning from a game?"

Figure 4.3: Pre-survey questions

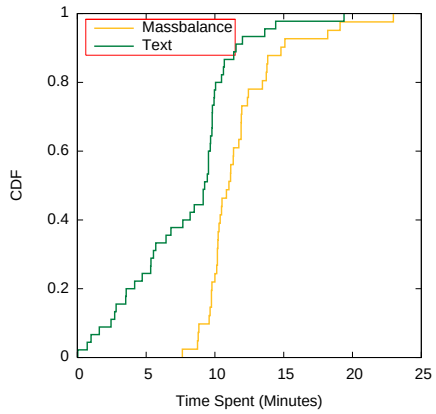


(a) "How entertained were you by the source?"

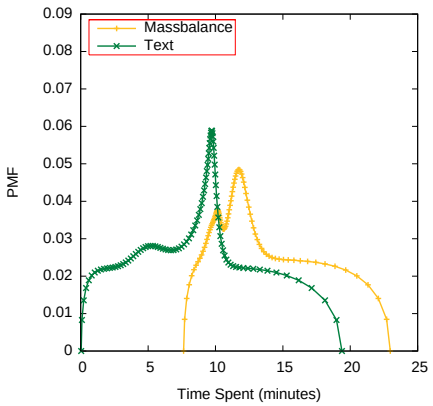


(b) "How engaged were you by the source?"

Figure 4.4: Post-survey questions



(a) CDF



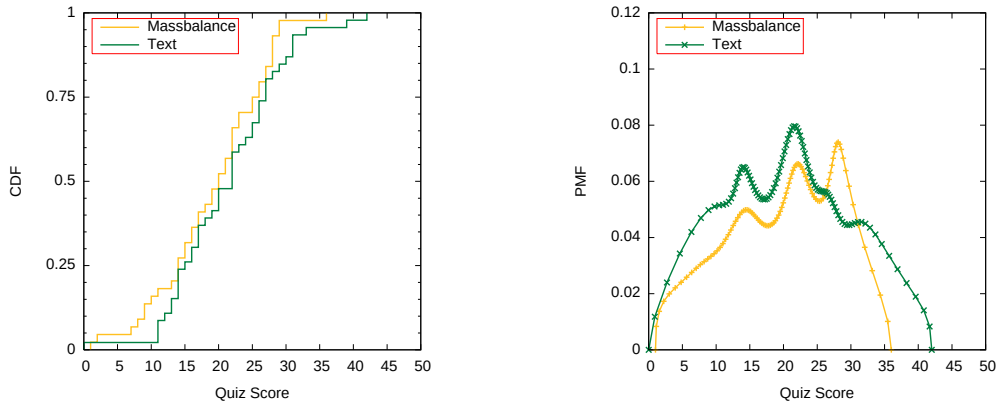
(b) PMF

Figure 4.5: Time spent reviewing the source

4.2 Analysis

Three important details emerged from the data. First, respondents severely disliked the text source. Figure 4.4(a) and Figure 4.4(b) both ask roughly the same question, and the answer is clear. MassBalance was rated in a roughly uniform distribution, with an equal number of users rating above a three and below a three. However, 72% of control users responded with a one or a two. Clearly, there was much dissatisfaction with the control.

The user was asked to spend ten minutes with their information source. No effort



(a) CDF (b) PMF

Figure 4.6: Quiz scores, weighted by difficulty

was made to enforce this. This was meant as a psychological test— with no additional reinforcement, how long would a user spend with the source? Figure 4.5(a) on the previous page shows this result clearly. 75% of the text users spent less than the ten minutes, and 75% of the MassBalance users spent more than ten minutes. In addition, the text users appeared to be clock-watchers. 45% of the times for text users were within one minute of the ten-minute period, while only 30% of the MassBalance users fell within the same range. Examining Figure 4.5(b) on the preceding page, the largest (and only) peak for the text group comes at about nine and a half minutes. However, the MassBalance group shows two peaks— one at about ten and a half minutes, the other, and much larger, at about 12 minutes. Combining this result with Figure 4.4(b), it seems that the MassBalance users were more engrossed in their task than the text users.

The quiz scores are obviously an important result to consider. Figure 4.6(a) shows these scores. The median for both groups is around twenty points out of a maximum of fifty. This is perhaps slightly lower than expected (by about five points) but within the acceptable range. This quiz concentrated on details without giving the user any significant idea of what to study from the source— low scores are to be expected. More significantly, both sources show a three-peak bell curve, which shows that there is a sense of order to the system. If the quizzes had been random guesses, the PMF would

appear to be a horizontal line— a uniform distribution. A bell-shaped curve shows a normal distribution.

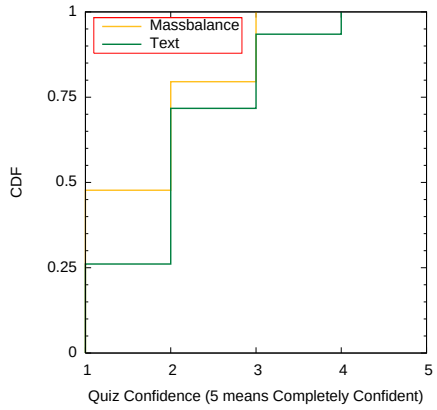


Figure 4.7: "How do you think you did on the quiz?"

Interestingly, it seemed that most respondents felt they had done quite badly on the quiz. This can be seen in Figure 4.7. 70% of the text users and 80% of the MassBalance users responded with a one or a two. This is remarkable because the quizzes are well within predicted ranges. (Figure 4.6(a) on the preceding page), Perhaps more warning should have been given that users were not expected to score anything close to a perfect score.

4.3 Sample Comments

Here are some of the comments left by users. The respondent is solicited for comments during the post-survey, and therefore they know which source they were given. I have therefore divided the comments into two groups by source.

4.3.1 MassBalance User Comments

> "I liked it. MassBalance had a good interface. My only problem was that some of the quiz questions very very specific, where they should have stuck to more general themes."[3]

[3] QnaedILX7yMAACvyCFw

This is a interesting point. Learning specific, involved details from a game could be somewhat more difficult than broad ideas. An interesting follow-up along this line of thought could involve two distinct games— one attempting to teach specific facts, and another attempting to paint a broad picture.

> "I found very little of the information needed for the quiz in the little time that I had to play with the game"[4]

This is the first of many complaints about the lack of time. Commenting respondents with the MassBalance source almost universally agreed that, given more time, they would have scored significantly higher on the quiz. When designing the experiment, I had balanced the need for more time against the loss of respondents due to the increased time requirement to participate, and I decided to bias the time in favor of more responses. It may be worth exploring the time aspect.

> "Other than finding out that balancing the budget is hard, I don't think I learned much from MassBalance. It's a cool little game, but I don't know if I'd use it for learning. I was mostly just clicking around and seeing if I could come close to a balanced budget in 10 minutes. Maybe if I spent more time and read more of the help screens, I would have learned more. [. . .]"[5]

This respondent demonstrates another common thread— many people do not like having to read a lot of information on a computer screen. Educational games would probably benefit from having the ratio of pictures to text be quite high. This respondent also complained about the lack of time.

> "Ten minutes seems a very short time to learn the type of minutiae being quizzed for. Also, playing a game like MassBalance is more suited for giving people a general idea of what the issues at play are than it is suited toward helping people memorize minute details. [. . .]"[6]

[4] QnEVNYLX7yMAAC5pWaU
[5] QmQoR4LX7yMAAF-pW1o
[6] QnPt-YLX7yMAACv0CPg

> "If there was say 15-20 minutes instead of 10 (or the 10 minutes started after reading the tutorial) I predict I could have learned and retained more information."[7]

These last respondents reinforce the previous points— more time would have resulted in more retention, and teaching toward a broader understanding may work better than minute details.

4.3.2 Text Source User Comments

An interesting note about the comments by the control group, the text-only source, is that they show that the respondents were almost universally annoyed with the source.

> "The static text as a control was biased by being in an incredibly boring format. Black text, gray background, simple organization...If it'd been a more engaging website visually, it would have made a difference."[8]

Perhaps more time should have been spent on improving the text source— though, perhaps, this reinforces the point that more interaction results in a better transfer of information.

> "The layout of the page with the information was poor, from an HCI perspective."[9]

Reinforcing the previous point, a better design would perhaps make the control source less boring.

> "I wasn't able to thoughtfully read the material in only ten minutes."[10]

While the time complaint was less frequent with the control source, a few were willing to stick with it longer. Perhaps a study linking this information with Myers-Briggs personality types could shed some more light on this subject.

[7] QnJokoLX7yMAACv1B0E
[8] QnJjb4LX7yMAACvkBJM
[9] QnN2GYLX7yMAACvjBis
[10] QnEZooLX7yMAACvjAjY

> "When you told me 'game' I assumed it was a game, and not some boring quiz. I had no interest whatsoever on the topic, and saw no reason to spend time learning about it."[11]

This respondent brings up another good point— perhaps governmental budgeting was a poor choice of topic. It was chosen due to availability of the game and due to budgeting being a fairly obscure topic— the target population was not expected to have much prior knowledge of this process. Another equally-obscure but more interesting topic could possibly alleviate this complaint.

> "You could set up a javascript thingy to time how long a person reads and then close the window."[12]

This respondent actually touches on a detail noted above— the ten-minute time requirement was intentionally not enforced in any way. I wished to see how long respondents would spend with the source, absent any controlling presence. This idea bore fruit, as Figure 4.5(a) on page 17 showed.

[11] QnMdy4LX7yMAACvjBhk
[12] QnD7AoLX7yMAACv1BPE

5 Conclusions

Education is the foundation of a technological society. Without education, technology stagnates. An educational game can engage a student, and encourage one to spend more time on the material. Its interactivity encourages a dialog, and motivates the student to learn more. A static source, such as a book, can actually demotivate a student and cause them to finish a task without learning as much.

I compared MassBalance, an interactive educational tool, to a static source containing information distilled from MassBalance. I solicited users to participate in a study to differentiate the tools. These users were randomly assigned to either the static or interactive source. I found that the respondents showed no improvement in quiz score, but there is a clear bias in Figure 4.5(a) on page 17 that shows that users will voluntarily spend more time on a more entertaining source than explicitly asked. More time studying will likely result in a better transfer of knowledge, and a more pleasurable experience in doing so.

There are many possible paths for a follow-up project to take. Interactivity may help some personality types more than others. Some may learn better by doing and by playing, while others may actually be better suited to reading a book. Relating Myers-Briggs personality types to the data may show that the study was weighted toward one personality type more than another.

This study quite heavily weighted toward computer science majors. This group may be more predisposed to interactive education than other groups. A larger study should be done, soliciting testers across a much wider geographical and ideological range. It would also help if WPI had a single point to look if you need help with a study. Either a web site or a mailing list would work well, as long as students were encouraged to participate.

Finally, a game could be specifically tailored to the problem. MassBalance was chosen partially because it was about a relatively boring topic, and partially because

it existed. A follow-up project could write a better game, and design a better static source to compare it to. Perhaps the static source could be selected first in this future study, with the interactive tool being the derivative work.

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APPENDIX A: USER STUDY

Project introduction page

Listing A.1: `text-intro.txt`

```
* Welcome! The purpose of this user study is to determine whether
  interactive media is a more efficient or effective learning tool than
  a more static source.
* During this study, you will:

    * Fill out a quick demographic survey.
    * Spend 10 minutes with either a static source or a game (randomly
      chosen).
    * Take a quiz on information learned from the source.
    * Fill out a quick exit survey.

* This process will not take more than 15 minutes.
* Participating in this study gives you the option of entering a drawing
  for a $50 gift certificate to Best Buy.
* Privacy statement: At no point will your email address or other
  identifying information be associated in any way with your demographic
  information or any other information gathered during this study.

                                [ Start ]
```

Info source introduction page

Listing A.2: `text-info-top.txt`

```
 * When you are ready, please click the "Continue" link below.
 * You will be presented with a new window containing information about
   the Massachusetts budget.
 * Please read through this information for 10 minutes, then close that
   window and click the "Done" button.
 * Do not close this window while you are reading through the
   information, as you will have to start completely over.
 * Continue

                                    [ Done ]
```

MassBalance's information in static form

Listing A.3: `text-info.txt`

```
Contents [Ledger]

     * 1 Taxes

          * 1.1 Dynamic Taxes
          * 1.2 Static Taxes

     * 2 Spending

          * 2.1 Education and Children
          * 2.2 Education Local Aid
          * 2.3 Higher Education
          * 2.4 Services to Children
          * 2.5 Youth Services
          * 2.6 Child Care Services

     * 3 Assistance to Poor

          * 3.1 Medicaid
          * 3.2 Cash Assistance
          * 3.3 Housing Assistance
          * 3.4 Elderly

     * 4 Sick and Disabled

          * 4.1 Mental Retardation
          * 4.2 Mental Health
          * 4.3 Public Health

     * 5 Transportation

          * 5.1 Massachusetts Highways
          * 5.2 Registry of Motor Vehicles

     * 6 Government

          * 6.1 General Government
          * 6.2 Local Government

     * 7 Central Costs

          * 7.1 Employee Benefits
          * 7.2 Debt Services

     * 8 Economic Development

          * 8.1 Business and Labor
          * 8.2 Environment

     * 9 Public Safety

          * 9.1 Corrections
          * 9.2 Judiciary
          * 9.3 Police
          * 9.4 District Attorney
          * 9.5 Attorney General
          * 9.6 Fire Services

                                   1 Taxes

   Below is a breakdown of all of the sources of funds in the Commonwealth.
   If you find it necessary to raise taxes to achieve a balanced budget,
   there are three main taxes to change: personal income tax, sales tax or
```

the gas tax. However, these are only examples- the actual opportunities for increasing tax revenues available to the governor and state legislators are practically unlimited. The are just the most well-known and well-understood options.

Taxes are inevitably controversial and a vote to raise them is one of the most difficult votes an elected official can make. Beyond the political controversy, there are economic considerations when raising taxes. Many economists believe that raising taxes during a weak economy will further damage the economy and delay any economic recovery. On the other hand, severe cuts to state programs can also cause a further decline in the economy by forcing the state to lay-off employees (and thus, if they don.t immediately find other employment, reducing their income and their ability to participate in the economy) or by reducing funding for services that are offered through a huge network of human service providers and forcing these private sector employees to compensate and initiate layoffs of workers in these fields.

1.1 Dynamic Taxes

1.1.1 Personal Income Tax

In 2000 Massachusetts' voters elected to cut the state personal income tax incrementally over three years. (Starting at 5.95% in 1999 the rate was scheduled to drop to 5.85% in 2000, 5.6% in 2001, and 5.3% in 2002, culminating at 5.0% in 2003) However, in 2002 as the fiscal crisis grew, the Legislature froze the tax rollback at 5.3% with a trigger to cut the rate to 5.0% when the economy improves. The state personal income tax is currently 5.3% on earned income.

1.1.2 Sales Tax

The state sales and use tax is levied at a rate of 5%. The five percent sales tax applies to the purchase price of most retail sales that take place in the Commonwealth, although there are also many exemptions (for instance, food for human consumption as well as clothing purchases that cost less than $175 are exempt). Many people view the sales tax as 'regressive', that is, the tax disproportionately impacts people with lower incomes because they pay the same rate and generally buy the same products as those with higher incomes (whether you earn $20,000 a year or $100,000 a year you still buy taxable cleaning products, toilet paper and tooth paste each year, or you may still need a new refrigerator). The sales tax also applies to restaurant meals and motor vehicles purchases. The use tax applies to property and services purchased in another state but intended for use within Massachusetts and is 5% also. Also, many people will argue that increasing the sales tax will hurt local retail sales, further weaken the economy and decrease the anticipated collections from the sales tax as people decide to shop less or else - and this is particularly true for Massachusetts towns closer to the New Hampshire border - make a greater share of their purchases out of state. Each one percent in the state sales tax raises approximately $750 million.

1.1.3 Gas Tax

The third tax option available is to increase the state tax on motor fuels. Besides raising additional revenue, some people believe that raising the gas tax is good for the environment because by making it more costly to drive a car, people will drive less and use public transportation or walk instead. On the other hand, many people must drive to get to work or as part of their employment and the gas tax will affect them disproportionately. Each 1-cent increase in the gas taxes would raise 33 million dollars.

1.2 Static Taxes

1.2.1 Alcoholic Beverage Tax

A tax on alcoholic beverages is charged based on alcoholic content.

1.2.2 Bank Tax

1.2.3 Cigarette Tax

The Health Protection Fund, voted into law in the 1992 state election, and amended in 1996, provides money for existing health programs and to create new smoking prevention projects. The fund is supported by a surtax per package on cigarettes. This tax is added on top of the sales tax of 5 percent on the total cost of cigarettes. In 2002, the tax was increased to $1.51 for a package of 20, or $15.31 for a ten-package carton, 30% of the price paid for cigars and smoking tobacco products by retailers; and 90% of the price paid by wholesalers on smokeless tobacco products.

1.2.4 Corporation Tax

The Massachusetts corporate excise is calculated by adding two different measures of tax: a net income measure, and either a property measure or a net worth measure, depending on whether the corporation is a tangible or an intangible property corporation. The income measure is calculated at a rate of 9.5 percent of the corporation's taxable net income apportioned to the Commonwealth. The property/net worth measure is imposed at a rate of $2.60 per $1,000 of either a corporation's taxable Massachusetts tangible property or its taxable net worth.

A corporation's total excise is the combination of the property/net worth and net income measures, or the minimum corporate excise, whichever is greater. For taxable years ending on or after December 31, 1988, the minimum corporate excise is $456.

1.2.5 Deeds Tax

1.2.6 Inheritance and Estates

The Massachusetts Estate Tax exemption is equal to that of the federal government. For 2003, estates of $700,000 or less are not subject to an estate tax, thus making the tax inapplicable to most estates. However, should an estate be over the exemption amount, the full value will be subject to the estate tax, not merely the difference between the estates value and the $700,000 exemption. Nevertheless, estates passing on to surviving spouses are not subject to the tax, regardless of the value, but will be taxed upon the death of the surviving spouse. For 2004, the amount will increase to $850,000, and to $950,000 for 2005. After that it will remain at $1 million.

1.2.7 Insurance Tax

1.2.8 Public Utilities Tax

1.2.9 Room Occupancy Tax

Massachusetts imposes a room occupancy excise tax of 5.7 percent on rooms rented for $15 or more per day. And each Massachusetts city and town has the option of levying up to an additional 4 percent. In addition, Massachusetts imposes a convention center financing fee of 2.75 percent on room occupancy in hotels, motels, or other lodging establishments in Boston, Cambridge, Chicopee, Springfield, West Springfield, and Worcester.

1.2.10 Federal Reimbursement Tax

1.2.11 Departmental and Other Revenue Tax

1.2.12 Inter-fund Transfers from Non-budgeted funds and other sources

2 Spending

2.1 Education and Children

```
   This block contains programs which help fund the many different areas of
   the Massachusetts Education System. It covers everything from public
   schools to public colleges. Also included in this block are programs that
   concern assistance to children and young adults of Massachusetts who need
   help in criminal matters, as well as funding day care for children in
   families on welfare.

2.2 Education Local Aid

   This program of spending is called Chapter 70 funding. The 1993 education
   reform law required that state spending on education be increased to
   remove disparities between wealthier and poorer communities. Increases or
   decreases to this category of spending have a direct effect on the quality
   of education children in the Commonwealth receive. Spending levels
   determine how much a town or city will have to set property taxes to pay
   its share of the local education budget and, consequently, how large or
   small class sizes will be, the salaries of teachers and administrators and
   the quality and quantity of educational materials such as textbooks.

2.3 Higher Education

   Massachusetts has many high quality public colleges. Spending in this
   program directly supports those institutions as well as loans and grants
   for middle and low-income students. Decreases in higher education funding
   can lead to increases in college fees that make it more difficult for some
   people to afford higher education.

2.4 Services to Children

   Spending in this program is to assist children and their families.
   Examples of spending in this category are funding for early intervention
   services, department of social services and related programs that assist
   children in crisis situations.

2.5 Youth Services

   Funding in this program is for department of youth services and numerous
   programs that assist young people who need services in matters ranging
   from criminal actions and substance abuse to job training and crisis
   intervention.

2.6 Child Care Services

   This program provides day care and other child care services for families
   on AFDC (welfare) and others who meet income criteria. This category of
   spending also supports the office of children which, among other things,
   monitors and regulates day care providers.

                              3 Assistance to Poor

   This block contains programs which assist families on welfare, as well as
   families assistance to families who cannot afford a home. In addition, it
   contains programs to help the elderly, and low-income families seeking
   health insurance.

3.1 Medicaid

   The state Medicaid program (called MassHealth in Massachusetts) is a
   health insurance program for low-income and some medium-income persons
   under age 65. MassHealth provides several health insurance assistance
   programs available which cover almost 1/6 of the State's population,
   including more than 1 million low-income, elderly and disabled
   Massachusetts residents. As with all state Medicaid programs, MassHealth
   is operated under certain federal guidelines. Massachusetts receives a 50%
   reimbursement from the federal government for money it spends on Medicaid
   programs.

3.2 Cash Assistance
```

Formerly referred to as 'welfare' the vast majority of spending in this program is now called Transitional Aid to Families with Dependent Children (AFDC). This is funding for families and in some cases individuals who need financial support. Among other things this program currently provides services to nearly 367,000 families and individuals across the state.

3.3 Housing Assistance

This program provides housing assistance in the form of grants and loans to individuals and the maintenance and operation of public housing facilities.

3.4 Elderly

This program provides assistance to the elderly in the form of transportation services, community centers and senior centers, and, most importantly, assistance with the cost of prescription drugs.

4 Sick and Disabled

This block contains programs which help fund those who monitor disease that could potentially spread throughout the state, as well as those that help fund programs to assist the disabled, including the Department of Mental Health and the Department of Mental Retardation.

4.1 Mental Retardation

This program provides funding for the Department of Mental Retardation (DMR) which operates homes and centers for individuals with developmental delays. Increases or decreases to these programs will reduce or improve the level of services available to persons with developmental disabilities.

4.2 Mental Health

This program provides funding for the Department of Mental Health (DMH), which operates programs and facilities that treat and assist persons with mental illness. Increases or decreases to these programs will reduce or improve the level of services available to persons with mental illness and in some cases may lead to increases in hospitalizations, injuries, and possibly arrests.

4.3 Public Health

The Department of Public Health runs numerous programs that monitor and regulate matters that affect the overall public health. These programs include monitoring the transmission of diseases (for instance, the newly occurring cases of SARS [Severe Acute Respiratory Syndrome]), the regulation of hospitals and other health care institutions and professions, and the overall coordination of public health issues as diverse as food safety and bioterrorism.

5 Transportation

This block contains programs which concern the quality of public transportation, as well as the quality of roads & bridges in the state of Massachusetts. In addition, it helps to fund the Massachusetts Bay Transportation Authority.

5.1 Massachusetts Highways

Funding for this program affects the frequency and quality of maintenance of the state's roads and bridges. Increases or decreases in this area will affect the quality of the roads and bridges and can have a direct impact on the safety and convenience of drivers.

5.2 Registry of Motor Vehicles

Funding for the state's RMV offices allows residents convenient access to license and registration renewal as well as allowing the RMV to provide services that help ensure the safety of vehicles on the road.

6 Government

This block contains programs which help to fund not only the state government, and all of its branches, but also to help fund local governments, which maintain everything from playgrounds and parks to water and sewers.

6.1 General Government

This block of spending provides funds for general government functions such as the executive branch, which administers the government and appoints judges and other government personnel. This block also funds officials who are in charge of government finance (for instance, bonds issued by the state) and agencies charged with guarding against government waste and abuse and the monitoring and regulation of businesses and corporations located in the state.

6.2 Local Government

Funding for local governments provides everything from maintenance of parks and playgrounds to local government services such as water and sewer.

7 Central Costs

This block contains programs which help fund group health insurance programs and State Employee pensions. It also helps with debt services in the state of Massachusetts.

7.1 Employee Benefits

Benefits include the cost of group health insurance programs, teachers' pensions and State employees' pensions. All of these are employment benefits common to employees throughout the state and includes everyone who is an employee of the state, from a janitor at a high school to a firefighter.

7.2 Debt Services

The State's obligation for the payment of interest and principal on certain bonded debt. Typically, the payment is mandatory since the 'full faith and credit' of the Commonwealth is pledged when the funds are borrowed. In simple terms, the bondholders are in line ahead of other State expenditures for programs.

8 Economic Development

This block contains programs which help to support the Department of Environmental Management and the Department of Environmental Protection by helping to enforce such laws as the clean air and clean water laws. Also, these programs help regulate central business activity, and support the unemployment trust fund.

8.1 Business and Labor

This program includes funding for agencies that regulate certain business activities and professions (everything from plumbers to accountants) and provides for worker training and other forms of assistance such as administering the workers compensation system and the unemployment trust fund.

8.2 Environment

This program provides funding for environmental protection and management. The DEM (Department of Environmental Management) and the DEP (Department of Environmental Protection) enforce the clean air and water laws, and manage state parks and wilderness to help protect open space and wildlife.

9 Public Safety

This block contains programs which help pay for law enforcement agents and law makers. These programs ensure swift and efficient justice in the state of Massachusetts.

9.1 Corrections

This program under criminal justice operates and maintains the prison system. Increases or decreases in this program affect the salaries of prison employees and the level of services and facilities available for inmates.

9.2 Judiciary

This program is for the state court system where all civil and criminal matters are adjudicated. Increases or decreases in this program affect the number of employees working within the court system, and consequently the speed with which civil and criminal matters are disposed of by a court.

9.3 Police

Funding for local and state police affects the level of protection available for residents. Increases or decreases in this program may mean fewer police can be employed in each city or town and may, over time, affect the overall crime rate.

9.4 District Attorney

The state's district attorneys (which are elected in each county) prosecute individuals accused of crimes. Increases or decreases in this area may effect the speed and efficiency of such prosecutions, and in extreme cases of under funding, may result in some crimes not being prosecuted.

9.5 Attorney General

The state's attorney general enforces numerous criminal laws that range from environmental pollution crimes to the prosecution of organized crime figures as well as many civil laws such as consumer protection laws.

9.6 Fire Services

Funding local and state fire department services affects how well cities, towns and the state can respond to fires and other disasters.

Ledger for info source

Listing A.4: `text-ledger.txt`

```
              Taxes                                Expenses
          Dynamic Taxes                     Education and Children
     Personal   $8,006,100,000.00  Education        $4,343,200,000.00  65.5%
       Income                      Local Aid
        Sales   $3,025,200,000.00  Higher           $1,046,600,000.00  15.8%
                                   Education
          Gas     $692,400,000.00  Services to        $709,100,000.00  10.7%
                                   Children
     Subtotal  $11,723,700,000.00  Youth              $134,800,000.00   2.0%
                                   Services
                                   Child Care         $398,400,000.00   6.0%
          Static Taxes             Services
                                   Subtotal         $6,632,100,000.00  26.9%
    Alcoholic      $65,000,000.00
     Beverage                                Assistance to Poor
         Bank     $210,400,000.00
    Cigarette     $454,200,000.00  Medicaid         $6,555,500,000.00  84.7%
  Corporation     $693,100,000.00  Cash               $763,300,000.00   9.9%
                                   Assistance
        Deeds     $142,900,000.00  Housing            $118,500,000.00   1.5%
                                   Assistance
  Inheritance     $175,900,000.00  Elderly            $301,900,000.00   3.9%
  and Estates
    Insurance     $381,300,000.00  Subtotal         $7,739,200,000.00  31.4%
       Public      $73,500,000.00
    Utilities                                Sick and Disabled
         Room     $128,000,000.00
    Occupancy
      Federal   $4,585,200,000.00  Mental           $1,066,700,000.00  49.6%
Reimbursement                      Retardation
 Departmental
    and Other   $1,489,100,000.00  Mental Health      $650,700,000.00  30.2%
      Revenue
   Inter-fund   $1,597,600,000.00  Public Health      $434,100,000.00  20.2%
    transfers
     Subtotal   $9,996,200,000.00  Subtotal         $2,151,500,000.00   8.7%
 Total Income  $21,719,900,000.00              Transportation
                                   Regional            $47,800,000.00  20.5%
                                   Transit
                                   Massachusetts      $115,200,000.00  49.3%
                                   Highways
                                   Registry of
                                   Motor               $70,600,000.00  30.2%
                                   Vehicles
                                   Subtotal           $233,600,000.00   0.9%
                                                 Government
                                   General            $662,300,000.00  32.1%
                                   Government
                                   Local            $1,401,200,000.00  67.9%
                                   Government
                                   Subtotal         $2,063,500,000.00   8.4%
                                               Central Costs
                                   Employee         $1,727,100,000.00  52.0%
                                   Benefits
                                   Debt Services    $1,594,500,000.00  48.0%
                                   Subtotal         $3,321,600,000.00  13.5%
                                            Economic Development
                                   Business and       $118,800,000.00  37.5%
                                   Labor
                                   Environment        $197,900,000.00  62.5%
                                   Subtotal           $316,700,000.00   1.3%
                                               Public Safety
                                   Corrections        $890,000,000.00  41.1%
```

		Judiciary	$630,100,000.00	29.1%
		Police	$258,600,000.00	12.0%
65		District Attorney	$84,800,000.00	3.9%
		Attorney General	$35,300,000.00	1.6%
		Fire Services	$265,000,000.00	12.2%
70		Subtotal	$2,163,800,000.00	8.8%
		Total Expenditure	$24,622,000,000.00	
	Net Gain/Loss		-$2,902,100,000.00	

MassBalance source introduction page

Listing A.5: `text-mb.txt`

```
* When you are ready, please click the "Continue" link below.
* You will be presented with a new window containing a game about the
  Massachusetts budget called MassBalance.
* Please play with MassBalance for 10 minutes, then close that window
  and click the "Done" button.
* Do not close this window while you are playing, as you will have to
  start completely over.
* Continue

                                    [ Done ]
```

Quiz

Listing A.6: `text-quiz.txt`

```
  * Now that you've been exposed to one of the sources, it's time to take
    the quiz.
  * The quiz is closed book. Please do not consult any external source of
    information.

What is most likely to happen if Massachusetts cuts Chapter 70 funding?

 ( ) Natural Disaster
 ( ) No gratis day care service
 ( ) Lawsuits from the rich
 ( ) Lawsuits from the poor

Support for educational and child-care programs typically makes up about
what % of the total budget?

 ( ) 20%
 ( ) 5%
 ( ) 10%
 ( ) 30%

Of these, Massachusetts makes the most money on

 ( ) Estate tax
 ( ) Alcoholic Beverage tax
 ( ) Sales tax
 ( ) Federal Reimbursement tax

Approximately how many families are on state welfare?

 ( ) 367,000
 ( ) 8,675,309
 ( ) 122,000
 ( ) 450,000

Chapter 70 funding exists to:

 ( ) Support Massachusetts collages
 ( ) Help students get college loans
 ( ) Provide day care services to families on welfare
 ( ) Help ensure that local schools receive enough money

In 2000, how much did Massachusetts voters vote to decrease income tax?

 ( ) .95%
 ( ) .89%
 ( ) 1.4%
 ( ) 1.2%

Which is not a static tax?

 ( ) Gas Tax
 ( ) Corporation Tax
 ( ) Bank Tax
 ( ) Alcoholic Beverage Tax

The Massachusetts state expenses were what % over the income in 2003?

 ( ) 15%
 ( ) 13%
 ( ) 18%
 ( ) 20%

Personal income tax is currently:
```

```
  ( ) 5.3%
  ( ) 5.0%
  ( ) 5.6%
  ( ) 5.95%

The bulk of the money earmarked for "assistance to poor" goes toward
  ( ) Cash assistance
  ( ) Medicade
  ( ) Elderly
  ( ) Housing assistance

AFDC is

  ( ) Housing program for the elderly
  ( ) Public health office
  ( ) Child care service
  ( ) Welfare

Most people agree that sales tax affects which group the most?

  ( ) Middle-class
  ( ) Working-class
  ( ) Upper-class
  ( ) White-collar

Massachusetts tends to make more on

  ( ) Dynamic Taxes
  ( ) Static Taxes

The budget deficit for 2003 was

  ( ) $2.4 billion
  ( ) $4.1 billion
  ( ) $3.2 billion
  ( ) $3.5 billion

How much reimbursement does Massachusetts receive from the federal government
for money spent on state Medicaid?

  ( ) 85%
  ( ) 25%
  ( ) 33%
  ( ) 50%

What is Massachusetts' Medicaid program called?

  ( ) MassCare
  ( ) Medicaid
  ( ) Medicare
  ( ) MassHealth

[ Submit ]
```

Pre-survey

Listing A.7: `text-survey.txt`

```
        First, we need to get some basic demographic information.
       Please answer every question to the best of your knowledge.
Graduation Year                 [____]
Major(s)                        [_____________________________________________]
                                [_____________________________________________]
Gender                          [______]

How responsible are you for your Not at All ( ) ( ) ( ) ( ) ( ) Completely
own finances?

How knowledgeable are you about  Not at All ( ) ( ) ( ) ( ) ( ) Completely
personal budgeting and finance?

How knowledgeable are you about
governmental budgeting and       Not at All ( ) ( ) ( ) ( ) ( ) Completely
finance?

How often have you been exposed
to games as learning tools in    Never ( ) ( ) ( ) ( ) ( ) Every Day
the past?

If you have, could you name a    _____________________________________________
few?                             _____________________________________________
                                 _____________________________________________

How capable are you of learning  Not at All ( ) ( ) ( ) ( ) ( ) Completely
from a game?
[ Submit ]
```

Post-survey

Listing A.8: `text-survey2.txt`

```
                Almost done! Just one more quick survey.
        Please answer every question to the best of your knowledge.
How much effort would you    Not Much ( ) ( ) ( ) ( ) ( ) Quite A Bit
say you put into the quiz?

How entertained were you by  Not at All ( ) ( ) ( ) ( ) ( ) Completely
the source?

How engaged were you by the  Not at All ( ) ( ) ( ) ( ) ( ) Completely
source?

How satisfied were you by    Not at All ( ) ( ) ( ) ( ) ( ) Completely
the source?

How do you think you did on  Badly ( ) ( ) ( ) ( ) ( ) Quite Well
the quiz?

Now that you've had a chance
to learn, how knowledgeable  Not at All ( ) ( ) ( ) ( ) ( ) Completely
are you about governmental
budgeting and finance?

                             _____________________________________________
                             _____________________________________________
                             _____________________________________________
Do you have any comments?    _____________________________________________
                             _____________________________________________
                             _____________________________________________
                             _____________________________________________
                             _____________________________________________

Do you wish to enter a drawing for a $50 gift certificate to Best Buy? If
so, please put your email address here. _____________________

Privacy statement: At no point will your email address or other
identifying information be associated in any way with your demographic
information or any other information gathered during this study. Your
address will not be shared with any third party, and will only be used to
contact you if you win.
[ Submit ]
```

Thank-you page

Listing A.9: `text-thanks.txt`

```
0 ||  Thanks for participating!
```

APPENDIX B: OTHER COLLECTED DATA

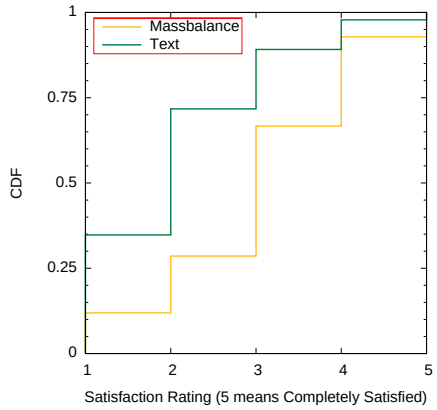

Figure B.1: "How satisfied were you by the source?"

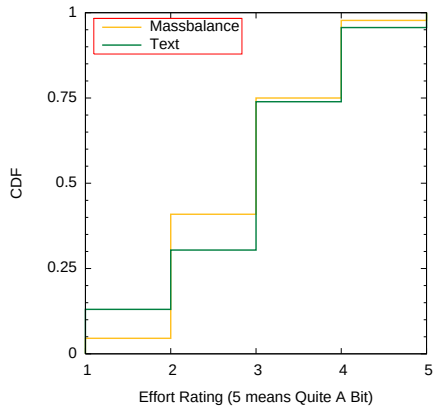

Figure B.2: "How much effort would you say you put into the quiz?"

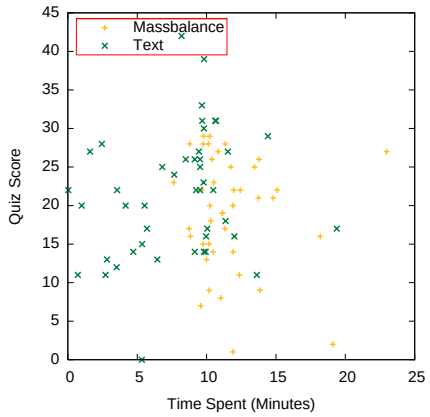

Figure B.3: Time spent vs. weighted quiz score

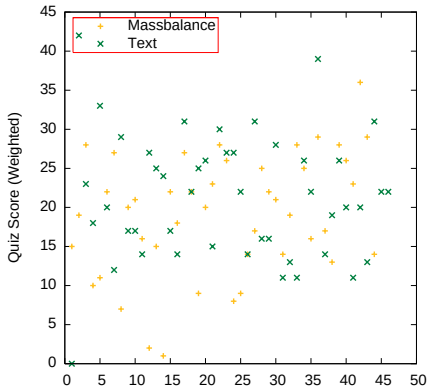

Figure B.4: Plot of quiz scores

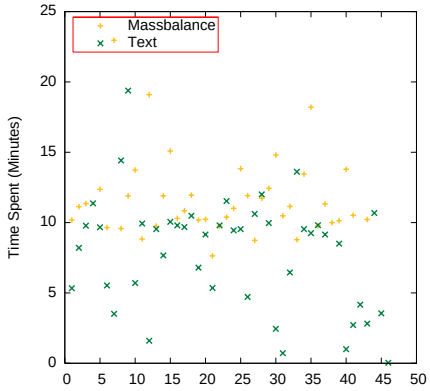

Figure B.5: Plot of time spent

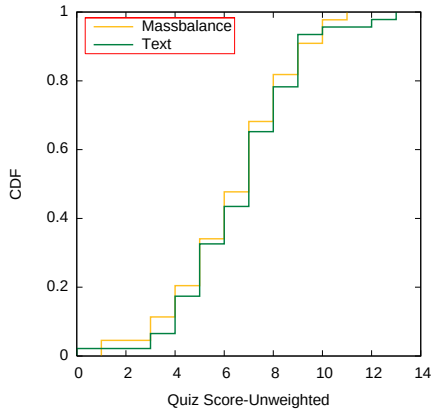

Figure B.6: Quiz scores, unweighted

APPENDIX C: CODE

Data-collection tool

Listing C.1: `index.cgi`

```
#!/usr/bin/perl -w
use strict;

use CGI;
use CGI::Carp qw/fatalsToBrowser/;
use Data::Dumper;

$Data::Dumper::Indent = 0;
$Data::Dumper::Purity = 1;
$Data::Dumper::Deepcopy = 1;
$Data::Dumper::Terse = 1;

my $q = new CGI;
my ($do, $id) = ($q->param('do'), $q->param('id'));

$id = $ENV{UNIQUE_ID} unless defined $id and $id;
die "Need a unique ID!" unless defined $id and $id;
die "Invalid ID" if $id =~ /[^A-Za-z0-9@-]/;

my $readonly = 1;

my ($ns, $text, $link);

sub loadpage
{
    my ($name, $fill) = @_;
    open(FILE, '<', "files/$name.html") or die "Couldn't open files/$name.html: $!\n";
    my $data;
    {
        undef $/;
        $data = <FILE>;
        close(FILE);
    }

    foreach (keys %{$fill})
    {
        $data =~ s/$_/$fill->{$_}/g
    }
    return $data;
}

sub record
{
    return if $readonly;
    my %data = @_;
    open(DATA, '>>', "data/$id")
        or die "Could not open data file: data/$id: $!\n";
    foreach (keys %data) {
        $data{$_} =~ s/[\r\n]+/\\n/g;
        print DATA lc($_)."=$data{$_}\n"
    }
    close(DATA);
}
```

```
print $q->header;

$do = 'DO NOT HANDLE ME' if not defined $do;
my %a = $q->Vars();

if ($do eq 's_info') {
    print loadpage('info-top', {TIME=>time(), SESSION=>$id});
    record(timesource=>time(), surveydata=>Dumper(\%a));
}
elsif ($do eq 's_mb') {
    print loadpage('mb', {TIME=>time(), SESSION=>$id});
    record(timesource=>time(), surveydata=>Dumper(\%a));
}
elsif ($do eq 'survey') {
    my $source = int(rand(2)) ? 's_info' : 's_mb';
    my $fill = {SOURCE=>$source, SESSION=>$id, FAIL=>""};
    print loadpage('survey', $fill);
    record(source=>$source, timesurvey=>time());
}
elsif ($do eq 'survey2') {
    print loadpage('survey2', {SESSION=>$id});
    record(timesurvey2=>time(), quizdata=>Dumper(\%a));
}
elsif ($do eq 'quiz') {
    print loadpage('quiz', {SESSION=>$id});
    record(timequiz=>time());
}
elsif ($do eq 'done')
{
    print loadpage('thanks');
    record(timedone=>time(), survey2data=>Dumper(\%a));
}
else {
    print loadpage('intro', {SESSION=>$id});
    record(ip=>$ENV{REMOTE_ADDR}, id=>$id, timestart=>time());
}
```

Quiz generator

Listing C.2: `makequiz.pl`

```
#!/usr/bin/perl -w
use strict;
use List::Util 'shuffle';
use Data::Dumper qw/Dumper/;

sub n($) {
    my $str = lc(shift);
    $str =~ s/[^\w]//g;
    return $str;
}

# Chance of collision is not high. We lose bits from the time, so it wraps
# every 48 days (2^22) or so. Every 48 days we have a 1/1024 chance of
# collision, assuming exact timing (a large assumption). I think this is
# acceptable. How often is a quiz going to get generated, anyway?
my $chk = time()<<10 + rand(2**10);

my @q = (
    {
        question=>'Which is not a static tax?',
        answers=>[
            'Gas Tax',
            'Bank Tax',
            'Alcoholic Beverage Tax',
            'Corporation Tax'
        ],
    },
    {
        question=>'Personal income tax is currently:',
        answers=>[
            '5.3%',
            '5.95%',
            '5.6%',
            '5.0%'
        ],
    },
    {
        question=>'Most people agree that sales tax affects which group the most?',
        answers=>[
            'Working-class',
            'Middle-class',
            'Upper-class',
            'White-collar'
        ],
    },
    {
        question=>'Chapter 70 funding exists to:',
        answers=>[
            'Help ensure that local schools receive enough money',
            'Support Massachusetts collages',
            'Provide day care services to families on welfare',
            'Help students get college loans'
        ],
    },
    {
        question=>'What is Massachusetts\' Medicaid program called?',
        answers=>[
            'MassHealth',
            'MassCare',
            'Medicaid',
            'Medicare'
        ],
    },
```

```
    {
        question=>'How much reimbursement does Massachusetts receive from the federal
            government for money spent on state Medicaid?',
        answers=>[
            '50%',
            '25%',
            '33%',
            '85%'
        ],
    },
    {
        question=>'AFDC is',
        answers=>[
            'Welfare',
            'Public health office',
            'Child care service',
            'Housing program for the elderly',
        ],
    },
    {
        question=>'Approximately how many families are on state welfare?',
        answers=>[
            '367,000',
            '8,675,309',
            '450,000',
            '122,000'
        ],
    },
    {
        question=>'The budget deficit for 2003 was',
        answers=>[
            '$3.2 billion',
            '$2.4 billion',
            '$3.5 billion',
            '$4.1 billion'
        ],
    },
    {
        question=>'Support for educational and child-care programs typically makes up
            about what % of the total budget?',
        answers=>[
            '30%',
            '20%',
            '10%',
            '5%'
        ],
    },
    {
        question=>'The bulk of the money earmarked for "assistance to poor" goes toward',
        answers=>[
            'Medicade',
            'Cash assistance',
            'Housing assistance',
            'Elderly'
        ],
    },
    {
        question=>'The Massachusetts state expenses were what % over the income in 2003?',
        answers=>[
            '13%',
            '15%',
            '18%',
            '20%'
        ],
    },
    {
        question=>'Of these, Massachusetts makes the most money on',
        answers=>[
```

```
            'Federal Reimbursement tax',
            'Alcoholic Beverage tax',
            'Sales tax',
            'Estate tax'
        ],
    },
    {
        question=>'Massachusetts tends to make more on',
        answers=>[
            'Dynamic Taxes',
            'Static Taxes',
        ],
    },
    {
        question=>'In 2000, how much did Massachusetts voters vote to decrease income tax
            ?',
        answers=>[
            '.95%',
            '1.2%',
            '1.4%',
            '.89%'
        ],
    },
    {
        question=>'What is most likely to happen if Massachusetts cuts Chapter 70 funding
            ?',
        answers=>[
            'Lawsuits from the poor',
            'Lawsuits from the rich',
            'No gratis day care service',
            'Natural Disaster'
        ],
    },
);

my %key;

print <<HERE;
<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.01 Transitional//EN" "http://www.w3.org/TR/html4
    /loose.dtd">
<html>
<head>
    <title></title>
    <meta http-equiv="Content-Type" content="text/html; charset=iso-8859-1">
    <meta name="Author" content="Mike Lundy">
    <link rel="stylesheet" href="files/style.css" type="text/css">
  </head>
<body>
  <form method="post" action="">
    <input type="hidden" name="do" value="survey2">
    <input type="hidden" name="id" value="SESSION">
    <input type="hidden" name="chk" value="$chk">
    <table style="width: 700px;">
    <tr>
        <td colspan="2">
          <div style="font-weight: bold; padding-top: 10px; padding-bottom: 10px; text-
              align: left">
          <ul>
          <li>Now that you've been exposed to one of the sources, it's time to take
              the quiz.</li>
          <li>The quiz is closed book. Please do not consult any external source of
              information.</li>
          </ul>
          </div>
        </td>
    </tr>
HERE
```

```
foreach my $q (shuffle @q) {
    print <<"    HERE";
    <tr><td class="r">$q->{question}</td>
      <td>
    HERE
    my $name = n($q->{question});
    my $i = 1;
    foreach (shuffle @{$q->{answers}}) {
        print "        <input type=\"radio\" name=\"$name\" value=\"$i\">$_<br>\n";
        $key{$name} = $i if $_ eq $q->{answers}->[0];
        $i++;
    }
    print "      </td>\n    </tr>\n";
}

print <<HERE;
    <tr><td colspan="2" style="text-align: center"><input type="submit" value="Submit"></
        td></tr>
  </table>
  </form>
</body>
</html>
HERE

$Data::Dumper::Indent = 2;
$Data::Dumper::Purity = 1;
$Data::Dumper::Deepcopy = 1;
$Data::Dumper::Varname = 'key';

open(KEY, '>', 'quizkey.pm');
print KEY <<HERE;
#!/usr/bin/perl -w
package Mike::IQP::QuizAnswers;
use strict;

HERE
print KEY 'our ', Dumper(\%key);
print KEY 'our $chk = ', $chk, ";\n";

print KEY "\n1;\n";
```

Graph-Generating Program

Listing C.3: `drawgraph.pl`

```
#!/usr/bin/perl -w
use strict;
use lib '.';

use Chart::Graph::Gnuplot qw(gnuplot);
use data;
use Data::Dumper qw/Dumper/;
use Safe;
use List::Util qw/max/;

#$Chart::Graph::save_tmpfiles = 1;
#$Chart::Graph::debug = 1;

my $c = new Safe;
$c->permit(qw/rand/);

my @call = ($0, @ARGV);

my @data = @{$Mike::IQP::data};

my %func;
# grep functions
$func{norm}{mb}   = sub {$_->{source} eq 's_mb'};
$func{norm}{info} = sub {$_->{source} eq 's_info'};

# map functions
$func{norm}{timespent}  = sub {($_->{timequiz} - $_->{timesource})/60};
$func{clos}{count}      = sub {my $c = 1; return sub {$c++}};
$func{norm}{quizscore}  = sub {$_->{quizcorrect}};
$func{norm}{quizdiffw}  = sub {$_->{quizweighted}};


# Gets 2 args, the value, and a sorted list of the values
my $full = 0;
$func{full}{cdf} = sub {
                my ($num, $data) = ($_[0], $_[1]);
                return (grep {$_ <= $num} @$data) / (scalar @$data);
            };
$func{full}{pmf} = sub {
                my ($num, $data) = ($_[0], $_[1]);
                return (grep {abs($_ - $num) < .02} @$data) / (scalar @$data);
            };

my $hack = shift;
my ($xname, $yname) = (shift, shift);
my @setnames = @ARGV[0..((@ARGV-2)/2)-1];
shift @ARGV foreach @setnames;

my ($x, $y) = (shift, shift);
my @sets = @ARGV;
#die "$x=$xname, $y=$yname, @sets=@setnames\n";
die "Need args\n" unless defined $x and defined $y and @sets > 0;

my $debug = 0;
my %names;
if ($debug) {
    %names = (x=>$x, y=>$y, sets=>[@sets]);
} else {
    %names = (x=>$xname, y=>$yname, sets=>[@setnames]);
}

my $after = ($x eq 'pmf');
```

```
my @reset;
foreach (@sets, $x, $y) {
    if (defined $func{norm}{"$_"})
    {
        $_ = \&{$func{norm}{$_}};
    }
    elsif (defined $func{clos}{"$_"})
    {
        my $func = &{$func{clos}{"$_"}};
        push(@reset, [\$_, $func{clos}{"$_"}]);
        $_ = \&$func;
    }
    elsif (defined $func{full}{"$_"})
    {
        die "A full-data function must be passed as the X axis\n" unless "$x" eq "$_";
        $full = 1;
        $_ = \&{$func{full}{$_}};
    }
    else {
        my $tmp = $_;
        if ($tmp =~ m/return\s+sub/s) {
            my $func = sub {my $ret = $c->reval($tmp); die "$@" if $@; return $ret};
            push(@reset, [\$_, $func]);
            $_ = \&{&$func};
        } else {
            $_ = sub {my $ret = $c->reval($tmp); die "$@" if $@; return $ret};
        }
    }
}

sub do_reset {
    foreach my $tmp (@reset) {
        ${$tmp->[0]} = &{$tmp->[1]};
    }
}

sub sort_assoc {
    my (@d, $by);
    ($d[0], $d[1], $by) = (@_);
    $by = (defined $by && $by) ? 1 : 0;
    my @hack;
    push(@hack, [$d[0]->[$_], $d[1]->[$_]]) foreach 0..$#{$d[$by]};
    @hack = sort {$a->[$by] <=> $b->[$by]} @hack;
    @{$d[0]} = map {$_->[0]} @hack;
    @{$d[1]} = map {$_->[1]} @hack;
}

sub dump_outliers {
    my ($x, $y, $num) = (@_);
    sort_assoc($x, $y, 1);
    # First, second, and third 25 quantile
    # Quartile value v = Np/q,
    # N = set size, p = quartile value, q = 4 (for quartile)
    my $n = ($#{@$y} + 1); # Set size

    my ($lwr, $med, $upr) = map {
        my $val = $n * $_/4;
        $val == int $val ?
             $y->[$val] + $y->[$val+1]/2 :
             $y->[int($val + .5)];
    } (1..3);

    my $outdelta = 2.25*($upr - $lwr); # (1.5+3.0)/2 * IQR

    my $i = 0;
    foreach (0..$#{@$y}) {
        if ($y->[$_] < $lwr - $outdelta) {
            $i++;
```

```
        } else {last;}
    }
    my %tmp;
    if ($i > 0) {
        @tmp{qw/x y/} = ([splice(@$x, 0, $i)], [splice(@$y, 0, $i)]);
        warn    defined $num ? "(Set $num) " : "",
                    "Lower Bound Outliers: ",
                        defined $tmp{x}->[0] ? "(X: @{$tmp{x}})" : "",
                        defined $tmp{y}->[0] ? "(Y: @{$tmp{y}})" : "",
                "\n";
    }

    $i = 0;
    foreach (reverse 0..$#{@$y}) {
        if ($y->[$_] > $upr + $outdelta) {
            $i++;
        } else {last;}
    }
    if ($i > 0) {
        @tmp{qw/x y/} = ([splice(@$x, -$i)], [splice(@$y, -$i)]);
        warn    defined $num ? "(Set $num) " : "",
                    "Upper Bound Outliers: ",
                        defined $tmp{x}->[0] ? "(X: @{$tmp{x}})" : "",
                        defined $tmp{y}->[0] ? "(Y: @{$tmp{y}})" : "",
                "\n";
    }
}

my @d, my $i = 0;

my @types = qw/9 10/;

foreach my $grep (@sets) {
    my ($type, $smooth) = ('points', undef);
    do_reset();
    my @set     = grep {&$grep} @data;
    my (@x, @y);
    my $cnt;

    # OK, for a regular thing, we have the X and Y values, no problem.
    # For a cdf, we have the map as $y and the cdf func as $x.
    # I need to use the map to get a _sorted_ tmp array.
    if ($full) {
        $type = 'steps';
        $smooth = 'bezier' if defined $ENV{SMOOTH};

        @x = grep {defined && $_ ne ""} map {&$y} @set;
        $cnt = scalar @x+1;
        if ($hack) {
            @y = grep {defined && $_ ne ""} map {$x->($_, \@x)} @x;
            sort_assoc(\@x, \@y);
        } else {
            dump_outliers([], \@x, $i); # @x is also now sorted
            @y = grep {defined && $_ ne ""} map {$x->($_, \@x)} @x;
        }
        unshift(@x, $x[0]);
        unshift(@y, 0);

        if ($after) {
            push(@x, $x[$#x]);
            push(@y, 0);
            $type = 'linespoints';
        }

    }
    else {
        @x = grep {defined && $_ ne ""} map {&$x} @set;
        @y = grep {defined && $_ ne ""} map {&$y} @set;
```

```
        $cnt = scalar @x;
        dump_outliers(\@x, \@y, $i);
        dump_outliers(\@y, \@x, $i);
        sort_assoc(\@x, \@y);
    }

    die "X and Y are not the same size\n" if scalar(@x) != scalar(@y);
    my @pts;

    #warn "X: @x\n";
    #warn "Y: @y\n";
    my $using = "1:2 lw 3 lt " . $types[$i % @types];
    $using .= " smooth $smooth"
        if $smooth;

    my ($pts, $out) = (scalar(@x), ($cnt-@x));
    if ($out > 0) {
        $out = ", $out outlier(s)";
    } else {
        $out = "";
    }
    push(@pts, ["$x[$_]", "$y[$_]"]) foreach 0..$#x;
    push(@d, [
                {   title=>"$names{sets}->[$i]" , type=>"matrix",
                    style=>$type, using=>$using},
                [@pts]]);
    $i++;
}

my $font = '"/usr/share/fonts/corefonts/arial.ttf"';

if ($full and $debug) {
    my $tmp = $names{x};
    $names{x} = $names{y};
    $names{y} = $tmp;
}

sub noparen($) {
    my $s = shift;
    $s =~ s/\(.*//;
    return $s;
}

my $out = 'pdf';
my $fn = "imgs/" . join('-', length($names{x}) ? noparen($names{x}) : "None" ,
                             length($names{y}) ? noparen($names{y}) : "None" ,
                             join('-', @{$names{sets}})) . ".$out";
$fn =~ s/ //g;

my %options = (
    #"title"       => "Graph Generated By '" . join(" ", @call) . "'",
    "title"       => '',
    "output type" => "$out",
    "output file" => $fn,
    "extra_opts"  => join("\n",
                        (
                          $out eq 'png'   ? qq/set terminal png size 1024,768 font $font
                              xffffff x000000 x000000 xFF0000 x0000FF crop/
                        : $out eq 'eps'   ? qq/set terminal postscript eps fontfile add
                            $font/
                        : $out eq 'latex' ? qq/set terminal latex/
                        : $out eq 'pdf' ? qq/set terminal pdf fsize 8/
                        : die("What is $out? I dunno. Bailing out.\n"),
                        #qq/set grid xtics ytics mytics lw 1, lw 1/,
                        qq/set size square/,
                        qq/unset grid/,
                        qq/set xlabel "$names{x}"/,
                        qq/set ylabel "$names{y}"/,
```

```
                            qq/set key top left Left reverse box .3/,
                            ($full && $hack != 3 && $hack != 0) ? qq/set ytics 0,0.25,1\nset
                                mytics 5\nset yrange [0:1]/ : qq//,
                            $hack == 1 ? qq/set xtics 1,1,5\nset xrange [1:5]/ :
                            ($hack == 2 || $hack == 3) ? qq/set xtics 0,5,50\nset xrange
                                [0:50]/ : qq//,
                        )),
    );

gnuplot(\%options, @d);
```

Program to read the session logs and output Perl-format data

Listing C.4: `dumpdata.pl`

```
#!/usr/bin/perl -w
use strict;

use File::Slurp;
use Data::Dumper qw/Dumper/;
use quizkey qw/key1 chk/;
use quizdiff qw/wgts/;

$Data::Dumper::Indent = 1;
$Data::Dumper::Purity = 1;
$Data::Dumper::Deepcopy = 1;
$Data::Dumper::Terse = 1;

my %dump = (
    surveydata=>1,
    quizdata=>1,
    survey2data=>1.
);

my %key = %{$Mike::IQP::QuizAnswers::key1};
my $qcnt = scalar keys %key;
my $chk = $Mike::IQP::QuizAnswers::chk;
my %wgt =  %{$Mike::IQP::QuizDiff::wgts};

my $dir = 'data';

my @datafiles = read_dir($dir);
@datafiles = grep { substr($_, 0, 1) eq 'Q'} @datafiles;
chdir($dir);

my @data;

foreach my $file (@datafiles) {
    my $data = getdata($file);
    next unless $data->{timedone};

    die "Bad Checksum!\n" unless $data->{quizdata}->{chk} eq $chk;

    $data->{source} = 's_mb' if $data->{source} =~ /s_mb/;
    my $right = 0;
    my $wrt = 0;
    foreach my $q (keys %key) {
        my $qdata = $data->{quizdata}->{$q};
        delete $data->{quizdata}->{$q};
        next unless defined $qdata;
        if ($qdata == $key{$q}) {
            $right++;
            $wrt += $wgt{$q}->{$data->{source} eq 's_mb' ? 'mb' : 'info'};
            $data->{quizdata}->{$q}->{right} = 1;
        } else {
            $data->{quizdata}->{$q}->{right} = 0;
        }
        $data->{quizdata}->{$q}->{canguess} = $wgt{$q}->{prek};
    }
    $data->{quizcorrect} = $right;
    $data->{quizweighted} = $wrt;
    delete $data->{survey2data}->{email};
    die Dumper $data;
    push(@data, $data);
}

```

```
print
    "#!/usr/bin/perl -w\n",
    "package Mike::IQP;\n",
    "use strict;\n",
    'our $data =', Dumper(\@data), ";\n1;\n";

sub getdata {
    my $file = shift;
    my @data = read_file($file);
    my $r = qr/(.*?)=(.*)/;
    my %ret;
    foreach my $line (@data) {
        $line =~ $r;
        my ($key, $val) = (lc($1), $2);
        $ret{$key} =  $dump{$key} ? scalar eval($val) : $val;
    }
    return \%ret;
}
```

The weight of each quiz question

Listing C.5: `quizdiff.pm`

```
#!/usr/bin/perl -w
package Mike::IQP::QuizDiff;
use strict;

our $wgts = {
    whatismostlikelytohappenifmassachusettscutschapter70funding => {
        info=>3,
        mb=>3,

    },
    supportforeducationalandchildcareprogramstypicallymakesupaboutwhatofthetotalbudget =>
        {
        info=>3,
        mb=>4,

    },
    ofthesemassachusettsmakesthemostmoneyon => {
        info=>3,
        mb=>4,

    },
    approximatelyhowmanyfamiliesareonstatewelfare => {
        info=>4,
        mb=>4,

    },
    chapter70fundingexiststo => {
        info=>4,
        mb=>4,

    },
    in2000howmuchdidmassachusettsvotersvotetodecreaseincometax => {
        info=>3,
        mb=>4,

    },
    whichisnotastatictax => {
        info=>3,
        mb=>4,

    },
    themassachusettsstateexpenseswerewhatovertheincomein2003 => {
        info=>4,
        mb=>2,

    },
    personalincometaxiscurrently => {
        info=>4,
        mb=>3,

    },
    thebulkofthemoneyearmarkedforassistancetopoorgoestoward => {
        info=>4,
        mb=>4,

    },
    afdcis => {
        info=>4,
        mb=>5,

    },
    mostpeopleagreethatsalestaxaffectswhichgroupthemost => {
        info=>2,
```

```
        mb=>2,

    },
    massachusettstendstomakemoreon => {
        info=>3,
        mb=>2,

    },
    thebudgetdeficitfor2003was => {
        info=>3,
        mb=>2,

    },
    howmuchreimbursementdoesmassachusettsreceivefromthefederalgovernmentformoneyspentonstatemedicaid
         => {
        info=>4,
        mb=>4,

    },
    whatismassachusettsmedicaidprogramcalled => {
        info=>1,
        mb=>1,

    },
};

1;
```

Javascript utility code

Listing C.6: `code.js`

```
var zeropad = function(num) { return ((num < 10) ? '0' : '') + num; }
var d       = new Date();
d.setMinutes(d.getMinutes() + 10);
var hr = d.getHours() % 12;
if (hr == 0) hr = 12;
var fin     = hr + ":" + zeropad(d.getMinutes());

var until   = function() {document.write("<b> (until " + fin + ")</b>")}
var click   = function() {document.write("At " + fin + ", click:")}
```

Style file

Listing C.7: `style.css`

```
td {
  border: 3px solid #e0e0e0;
  background-color: #c0c0c0;
  vertical-align: middle;
  text-align: left;
  padding: 5px;
}

td.r {
  text-align: right;
  width: 250px;
  padding: 5px;
}

body {
  background-color: #006699;
}

table {
  border: 3px dashed black;
  border-collapse: collapse;
  margin-left: auto;
  margin-right: auto;
}

li {
    margin-bottom: 20px;
}

div {
  border: 3px solid #e0e0e0;
  background-color: #c0c0c0;
  vertical-align: middle;
  text-align: left;
  margin-left: auto;
  margin-right: auto;
}
```

Project introduction page

Listing C.8: `intro.html`

```
<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.01 Transitional//EN" "http://www.w3.org/TR/html4
    /loose.dtd">
<html>
<head>
    <title></title>
    <meta http-equiv="Content-Type" content="text/html; charset=iso-8859-1">
    <meta name="Author" content="Mike Lundy">
    <link rel="stylesheet" href="files/style.css" type="text/css">
    <style type="text/css">
      li.a {
        margin-bottom: 2px;
      }
    </style>
</head>
<body>
    <div style="width: 640px">
      <ul>
        <li>Welcome! The purpose of this user study is to determine whether
           interactive media is a more efficient or effective
           learning tool than a more static source.</li>
        <li>During this study, you will:
          <ul>
            <li class="a">Fill out a quick demographic survey.</li>
            <li class="a">Spend 10 minutes with either a static source or a game (randomly
                 chosen).</li>
            <li class="a">Take a quiz on information learned from the source.</li>
            <li class="a">Fill out a quick exit survey.</li>
          </ul>
        </li>
        <li>This process will not take more than 15 minutes.</li>
        <li>Participating in this study gives you the option of entering a
        drawing for a <b>$50 gift certificate to Best Buy.</b></li>
        <li><i><small>Privacy statement: At no point will your email address or other
           identifying information be associated in any way with your
           demographic information or any other information gathered during
           this study.</small></i></li>
      </ul>
      <div style="text-align: center">
        <br>
        <form method="post" action="">
          <input type="hidden" name="do" value="survey">
          <input type="hidden" name="id" value="SESSION">
          <input type="submit" value="Start">
        </form>
      </div>
    </div>
</body>
</html>
```

Info source introduction page

Listing C.9: `info-top.html`

```
<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.01 Transitional//EN" "http://www.w3.org/TR/html4
    /loose.dtd">
<html>
<head>
    <title></title>
    <meta http-equiv="Content-Type" content="text/html; charset=iso-8859-1">
    <meta name="Author" content="Mike Lundy">
    <link rel="stylesheet" href="files/style.css" type="text/css">
    <script type="text/javascript" src="files/code.js"></script>
</head>
<body>
    <div style="width: 640px">
      <ul>
        <li>When you are ready, please click the "Continue" link below.</li>
        <li>You will be presented with a new window containing information about the
            Massachusetts budget.</li>
        <li>Please read through this information for 10 minutes<script type="text/
            javascript">until()</script>,
            then close that window and click the "Done" button.</li>
        <li>Do not close this window while you are reading through the information,
            as you will have to start completely over.</li>

        <li><a href="files/info.html" target="blank">Continue</a></li>
      </ul>
      <div style="text-align: center">
        <br>
        <script type="text/javascript">click()</script>
        <form method="post" action="">
          <input type="hidden" name="time" value="TIME">
          <input type="hidden" name="id" value="SESSION">
          <input type="submit" value="Done">
          <input type="hidden" name="do" value="quiz">
        </form>
      </div>
    </div>
</body>
</html>
```

MassBalance's information in static form

Listing C.10: `info.html`

```
<!DOCTYPE html PUBLIC "-//W3C//DTD HTML 4.01 Transitional//EN">
<!--Converted with LaTeX2HTML 2002-2-1 (1.71)
original version by:  Nikos Drakos, CBLU, University of Leeds
* revised and updated by:  Marcus Hennecke, Ross Moore, Herb Swan
* with significant contributions from:
  Jens Lippmann, Marek Rouchal, Martin Wilck and others -->

<html>
<head>
  <meta name="generator" content=
  "HTML Tidy for Linux/x86 (vers 1st August 2004), see www.w3.org">

  <title>info</title>
  <meta name="description" content="info">
  <meta name="keywords" content="info">
  <meta name="resource-type" content="document">
  <meta name="distribution" content="global">
  <meta http-equiv="Content-Type" content=
  "text/html; charset=us-ascii">
  <meta name="Generator" content="LaTeX2HTML v2002-2-1">
  <meta http-equiv="Content-Style-Type" content="text/css">
  <link rel="stylesheet" href="style.css" type="text/css">
  <style type="text/css">
    li {
      margin-bottom: 5px;
    }
  </style>
</head>

<body>
  <div>
  <h2><a name="SECTION00010000000000000000" id=
      "SECTION00010000000000000000">Contents</a> [<a href="ledger.html" target="blank">
          Ledger</a>]</h2>
  <!--Table of Contents-->

  <ul>
    <li>
      <a name="tex2html56" href=
      "info.html#SECTION00020000000000000000" id="tex2html56">1
      Taxes</a>

      <ul>
        <li><a name="tex2html57" href=
        "info.html#SECTION00021000000000000000" id="tex2html57">1.1
        Dynamic Taxes</a></li>

        <li><a name="tex2html58" href=
        "info.html#SECTION00022000000000000000" id="tex2html58">1.2
        Static Taxes</a></li>
      </ul><br>
    </li>

    <li>
      <a name="tex2html59" href=
      "info.html#SECTION00030000000000000000" id="tex2html59">2
      Spending</a>

      <ul>
        <li><a name="tex2html60" href=
        "info.html#SECTION00031000000000000000" id="tex2html60">2.1
        Education and Children</a></li>
```

```
        <li><a name="tex2html61" href=
        "info.html#SECTION00032000000000000000" id="tex2html61">2.2
        Education Local Aid</a></li>

        <li><a name="tex2html62" href=
        "info.html#SECTION00033000000000000000" id="tex2html62">2.3
        Higher Education</a></li>

        <li><a name="tex2html63" href=
        "info.html#SECTION00034000000000000000" id="tex2html63">2.4
        Services to Children</a></li>

        <li><a name="tex2html64" href=
        "info.html#SECTION00035000000000000000" id="tex2html64">2.5
        Youth Services</a></li>

        <li><a name="tex2html65" href=
        "info.html#SECTION00036000000000000000" id="tex2html65">2.6
        Child Care Services</a></li>
      </ul><br>
    </li>

    <li>
      <a name="tex2html66" href=
      "info.html#SECTION00040000000000000000" id="tex2html66">3
      Assistance to Poor</a>

      <ul>
        <li><a name="tex2html67" href=
        "info.html#SECTION00041000000000000000" id="tex2html67">3.1
        Medicaid</a></li>

        <li><a name="tex2html68" href=
        "info.html#SECTION00042000000000000000" id="tex2html68">3.2
        Cash Assistance</a></li>

        <li><a name="tex2html69" href=
        "info.html#SECTION00043000000000000000" id="tex2html69">3.3
        Housing Assistance</a></li>

        <li><a name="tex2html70" href=
        "info.html#SECTION00044000000000000000" id="tex2html70">3.4
        Elderly</a></li>
      </ul><br>
    </li>

    <li>
      <a name="tex2html71" href=
      "info.html#SECTION00050000000000000000" id="tex2html71">4
      Sick and Disabled</a>

      <ul>
        <li><a name="tex2html72" href=
        "info.html#SECTION00051000000000000000" id="tex2html72">4.1
        Mental Retardation</a></li>

        <li><a name="tex2html73" href=
        "info.html#SECTION00052000000000000000" id="tex2html73">4.2
        Mental Health</a></li>

        <li><a name="tex2html74" href=
        "info.html#SECTION00053000000000000000" id="tex2html74">4.3
        Public Health</a></li>
      </ul><br>
    </li>

    <li>
      <a name="tex2html75" href=
```

```
      "info.html#SECTION00060000000000000000" id="tex2html75">5
      Transportation</a>

      <ul>
        <li><a name="tex2html76" href=
        "info.html#SECTION00061000000000000000" id="tex2html76">5.1
        Massachusetts Highways</a></li>

        <li><a name="tex2html77" href=
        "info.html#SECTION00062000000000000000" id="tex2html77">5.2
        Registry of Motor Vehicles</a></li>
      </ul><br>
    </li>

    <li>
      <a name="tex2html78" href=
      "info.html#SECTION00070000000000000000" id="tex2html78">6
      Government</a>

      <ul>
        <li><a name="tex2html79" href=
        "info.html#SECTION00071000000000000000" id="tex2html79">6.1
        General Government</a></li>

        <li><a name="tex2html80" href=
        "info.html#SECTION00072000000000000000" id="tex2html80">6.2
        Local Government</a></li>
      </ul><br>
    </li>

    <li>
      <a name="tex2html81" href=
      "info.html#SECTION00080000000000000000" id="tex2html81">7
      Central Costs</a>

      <ul>
        <li><a name="tex2html82" href=
        "info.html#SECTION00081000000000000000" id="tex2html82">7.1
        Employee Benefits</a></li>

        <li><a name="tex2html83" href=
        "info.html#SECTION00082000000000000000" id="tex2html83">7.2
        Debt Services</a></li>
      </ul><br>
    </li>

    <li>
      <a name="tex2html84" href=
      "info.html#SECTION00090000000000000000" id="tex2html84">8
      Economic Development</a>

      <ul>
        <li><a name="tex2html85" href=
        "info.html#SECTION00091000000000000000" id="tex2html85">8.1
        Business and Labor</a></li>

        <li><a name="tex2html86" href=
        "info.html#SECTION00092000000000000000" id="tex2html86">8.2
        Environment</a></li>
      </ul><br>
    </li>

    <li>
      <a name="tex2html87" href=
      "info.html#SECTION00010000000000000000" id="tex2html87">9
      Public Safety</a>

      <ul>
```

```
        <li><a name="tex2html88" href=
        "info.html#SECTION000101000000000000000" id=
        "tex2html88">9.1 Corrections</a></li>

        <li><a name="tex2html89" href=
        "info.html#SECTION000102000000000000000" id=
        "tex2html89">9.2 Judiciary</a></li>

        <li><a name="tex2html90" href=
        "info.html#SECTION000103000000000000000" id=
        "tex2html90">9.3 Police</a></li>

        <li><a name="tex2html91" href=
        "info.html#SECTION000104000000000000000" id=
        "tex2html91">9.4 District Attorney</a></li>

        <li><a name="tex2html92" href=
        "info.html#SECTION000105000000000000000" id=
        "tex2html92">9.5 Attorney General</a></li>

        <li><a name="tex2html93" href=
        "info.html#SECTION000106000000000000000" id=
        "tex2html93">9.6 Fire Services</a></li>
      </ul>
    </li>
</ul><!--End of Table of Contents-->

<h1><a name="SECTION000200000000000000000" id=
"SECTION000200000000000000000">1 Taxes</a></h1>

<p>Below is a breakdown of all of the sources of funds in the
Commonwealth. If you find it necessary to raise taxes to achieve
a balanced budget, there are three main taxes to change: personal
income tax, sales tax or the gas tax. However, these are only
examples- the actual opportunities for increasing tax revenues
available to the governor and state legislators are practically
unlimited. The are just the most well-known and well-understood
options.</p>

<p>Taxes are inevitably controversial and a vote to raise them is
one of the most difficult votes an elected official can make.
Beyond the political controversy, there are economic
considerations when raising taxes. Many economists believe that
raising taxes during a weak economy will further damage the
economy and delay any economic recovery. On the other hand,
severe cuts to state programs can also cause a further decline in
the economy by forcing the state to lay-off employees (and thus,
if they don.t immediately find other employment, reducing their
income and their ability to participate in the economy) or by
reducing funding for services that are offered through a huge
network of human service providers and forcing these private
sector employees to compensate and initiate layoffs of workers in
these fields.</p>

<h2><a name="SECTION000210000000000000000" id=
"SECTION000210000000000000000">1.1 Dynamic Taxes</a></h2>

<h3><a name="SECTION000211000000000000000" id=
"SECTION000211000000000000000">1.1.1 Personal Income Tax</a></h3>

<p>In 2000 Massachusetts' voters elected to cut the state
personal income tax incrementally over three years. (Starting at
5.95% in 1999 the rate was scheduled to drop to 5.85% in 2000,
5.6% in 2001, and 5.3% in 2002, culminating at 5.0% in 2003)
However, in 2002 as the fiscal crisis grew, the Legislature froze
the tax rollback at 5.3% with a trigger to cut the rate to 5.0%
when the economy improves. The state personal income tax is
currently 5.3% on earned income.</p>
```

```
    <h3><a name="SECTION00021200000000000000" id=
    "SECTION00021200000000000000">1.1.2 Sales Tax</a></h3>

    <p>The state sales and use tax is levied at a rate of 5%. The
    five percent sales tax applies to the purchase price of most
    retail sales that take place in the Commonwealth, although there
    are also many exemptions (for instance, food for human
    consumption as well as clothing purchases that cost less than
    $175 are exempt). Many people view the sales tax as 'regressive',
    that is, the tax disproportionately impacts people with lower
    incomes because they pay the same rate and generally buy the same
    products as those with higher incomes (whether you earn $20,000 a
    year or $100,000 a year you still buy taxable cleaning products,
    toilet paper and tooth paste each year, or you may still need a
    new refrigerator). The sales tax also applies to restaurant meals
    and motor vehicles purchases. The use tax applies to property and
    services purchased in another state but intended for use within
    Massachusetts and is 5% also. Also, many people will argue that
    increasing the sales tax will hurt local retail sales, further
    weaken the economy and decrease the anticipated collections from
    the sales tax as people decide to shop less or else - and this is
    particularly true for Massachusetts towns closer to the New
    Hampshire border - make a greater share of their purchases out of
    state. Each one percent in the state sales tax raises
    approximately $750 million.</p>

    <h3><a name="SECTION00021300000000000000" id=
    "SECTION00021300000000000000">1.1.3 Gas Tax</a></h3>

    <p>The third tax option available is to increase the state tax on
    motor fuels. Besides raising additional revenue, some people
    believe that raising the gas tax is good for the environment
    because by making it more costly to drive a car, people will
    drive less and use public transportation or walk instead. On the
    other hand, many people must drive to get to work or as part of
    their employment and the gas tax will affect them
    disproportionately. Each 1-cent increase in the gas taxes would
    raise 33 million dollars.</p>

    <h2><a name="SECTION00022000000000000000" id=
    "SECTION00022000000000000000">1.2 Static Taxes</a></h2>

    <h3><a name="SECTION00022100000000000000" id=
    "SECTION00022100000000000000">1.2.1 Alcoholic Beverage
    Tax</a></h3>

    <p>A tax on alcoholic beverages is charged based on alcoholic
    content.</p>

    <h3><a name="SECTION00022200000000000000" id=
    "SECTION00022200000000000000">1.2.2 Bank Tax</a></h3>

    <h3><a name="SECTION00022300000000000000" id=
    "SECTION00022300000000000000">1.2.3 Cigarette Tax</a></h3>

    <p>The Health Protection Fund, voted into law in the 1992 state
    election, and amended in 1996, provides money for existing health
    programs and to create new smoking prevention projects. The fund
    is supported by a surtax per package on cigarettes. This tax is
    added on top of the sales tax of 5 percent on the total cost of
    cigarettes. In 2002, the tax was increased to $1.51 for a package
    of 20, or $15.31 for a ten-package carton, 30% of the price paid
    for cigars and smoking tobacco products by retailers; and 90% of
    the price paid by wholesalers on smokeless tobacco products.</p>

    <h3><a name="SECTION00022400000000000000" id=
    "SECTION00022400000000000000">1.2.4 Corporation Tax</a></h3>
```

```
<p>The Massachusetts corporate excise is calculated by adding two
different measures of tax: a net income measure, and either a
property measure or a net worth measure, depending on whether the
corporation is a tangible or an intangible property corporation.
The income measure is calculated at a rate of 9.5 percent of the
corporation's taxable net income apportioned to the Commonwealth.
The property/net worth measure is imposed at a rate of $2.60 per
$1,000 of either a corporation's taxable Massachusetts tangible
property or its taxable net worth.</p>

<p>A corporation's total excise is the combination of the
property/net worth and net income measures, or the minimum
corporate excise, whichever is greater. For taxable years ending
on or after December 31, 1988, the minimum corporate excise is
$456.</p>

<h3><a name="SECTION00022500000000000000" id=
"SECTION00022500000000000000">1.2.5 Deeds Tax</a></h3>

<h3><a name="SECTION00022600000000000000" id=
"SECTION00022600000000000000">1.2.6 Inheritance and
Estates</a></h3>

<p>The Massachusetts Estate Tax exemption is equal to that of the
federal government. For 2003, estates of $700,000 or less are not
subject to an estate tax, thus making the tax inapplicable to
most estates. However, should an estate be over the exemption
amount, the full value will be subject to the estate tax, not
merely the difference between the estates value and the $700,000
exemption. Nevertheless, estates passing on to surviving spouses
are not subject to the tax, regardless of the value, but will be
taxed upon the death of the surviving spouse. For 2004, the
amount will increase to $850,000, and to $950,000 for 2005. After
that it will remain at $1 million.</p>

<h3><a name="SECTION00022700000000000000" id=
"SECTION00022700000000000000">1.2.7 Insurance Tax</a></h3>

<h3><a name="SECTION00022800000000000000" id=
"SECTION00022800000000000000">1.2.8 Public Utilities Tax</a></h3>

<h3><a name="SECTION00022900000000000000" id=
"SECTION00022900000000000000">1.2.9 Room Occupancy Tax</a></h3>

<p>Massachusetts imposes a room occupancy excise tax of 5.7
percent on rooms rented for $15 or more per day. And each
Massachusetts city and town has the option of levying up to an
additional 4 percent. In addition, Massachusetts imposes a
convention center financing fee of 2.75 percent on room occupancy
in hotels, motels, or other lodging establishments in Boston,
Cambridge, Chicopee, Springfield, West Springfield, and
Worcester.</p>

<h3><a name="SECTION00022100000000000000" id=
"SECTION00022100000000000000">1.2.10 Federal Reimbursement
Tax</a></h3>

<h3><a name="SECTION00022110000000000000" id=
"SECTION00022110000000000000">1.2.11 Departmental and Other
Revenue Tax</a></h3>

<h3><a name="SECTION00022120000000000000" id=
"SECTION00022120000000000000">1.2.12 Inter-fund Transfers from
Non-budgeted funds and other sources</a></h3>

<h1><a name="SECTION00030000000000000000" id=
"SECTION00030000000000000000">2 Spending</a></h1>
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<h2><a name="SECTION00031000000000000000" id=
"SECTION00031000000000000000">2.1 Education and Children</a></h2>

<p>This block contains programs which help fund the many
different areas of the Massachusetts Education System. It covers
everything from public schools to public colleges. Also included
in this block are programs that concern assistance to children
and young adults of Massachusetts who need help in criminal
matters, as well as funding day care for children in families on
welfare.</p>

<h2><a name="SECTION00032000000000000000" id=
"SECTION00032000000000000000">2.2 Education Local Aid</a></h2>

<p>This program of spending is called Chapter 70 funding. The
1993 education reform law required that state spending on
education be increased to remove disparities between wealthier
and poorer communities. Increases or decreases to this category
of spending have a direct effect on the quality of education
children in the Commonwealth receive. Spending levels determine
how much a town or city will have to set property taxes to pay
its share of the local education budget and, consequently, how
large or small class sizes will be, the salaries of teachers and
administrators and the quality and quantity of educational
materials such as textbooks.</p>

<h2><a name="SECTION00033000000000000000" id=
"SECTION00033000000000000000">2.3 Higher Education</a></h2>

<p>Massachusetts has many high quality public colleges. Spending
in this program directly supports those institutions as well as
loans and grants for middle and low-income students. Decreases in
higher education funding can lead to increases in college fees
that make it more difficult for some people to afford higher
education.</p>

<h2><a name="SECTION00034000000000000000" id=
"SECTION00034000000000000000">2.4 Services to Children</a></h2>

<p>Spending in this program is to assist children and their
families. Examples of spending in this category are funding for
early intervention services, department of social services and
related programs that assist children in crisis situations.</p>

<h2><a name="SECTION00035000000000000000" id=
"SECTION00035000000000000000">2.5 Youth Services</a></h2>

<p>Funding in this program is for department of youth services
and numerous programs that assist young people who need services
in matters ranging from criminal actions and substance abuse to
job training and crisis intervention.</p>

<h2><a name="SECTION00036000000000000000" id=
"SECTION00036000000000000000">2.6 Child Care Services</a></h2>

<p>This program provides day care and other child care services
for families on AFDC (welfare) and others who meet income
criteria. This category of spending also supports the office of
children which, among other things, monitors and regulates day
care providers.</p>

<h1><a name="SECTION00040000000000000000" id=
"SECTION00040000000000000000">3 Assistance to Poor</a></h1>

<p>This block contains programs which assist families on welfare,
as well as families assistance to families who cannot afford a
home. In addition, it contains programs to help the elderly, and
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low-income families seeking health insurance.</p>

<h2><a name="SECTION00041000000000000000" id=
"SECTION00041000000000000000">3.1 Medicaid</a></h2>

<p>The state Medicaid program (called MassHealth in
Massachusetts) is a health insurance program for low-income and
some medium-income persons under age 65. MassHealth provides
several health insurance assistance programs available which
cover almost 1/6 of the State's population, including more than 1
million low-income, elderly and disabled Massachusetts residents.
As with all state Medicaid programs, MassHealth is operated under
certain federal guidelines. Massachusetts receives a 50%
reimbursement from the federal government for money it spends on
Medicaid programs.</p>

<h2><a name="SECTION00042000000000000000" id=
"SECTION00042000000000000000">3.2 Cash Assistance</a></h2>

<p>Formerly referred to as 'welfare' the vast majority of
spending in this program is now called Transitional Aid to
Families with Dependent Children (AFDC). This is funding for
families and in some cases individuals who need financial
support. Among other things this program currently provides
services to nearly 367,000 families and individuals across the
state.</p>

<h2><a name="SECTION00043000000000000000" id=
"SECTION00043000000000000000">3.3 Housing Assistance</a></h2>

<p>This program provides housing assistance in the form of grants
and loans to individuals and the maintenance and operation of
public housing facilities.</p>

<h2><a name="SECTION00044000000000000000" id=
"SECTION00044000000000000000">3.4 Elderly</a></h2>

<p>This program provides assistance to the elderly in the form of
transportation services, community centers and senior centers,
and, most importantly, assistance with the cost of prescription
drugs.</p>

<h1><a name="SECTION00050000000000000000" id=
"SECTION00050000000000000000">4 Sick and Disabled</a></h1>

<p>This block contains programs which help fund those who monitor
disease that could potentially spread throughout the state, as
well as those that help fund programs to assist the disabled,
including the Department of Mental Health and the Department of
Mental Retardation.</p>

<h2><a name="SECTION00051000000000000000" id=
"SECTION00051000000000000000">4.1 Mental Retardation</a></h2>

<p>This program provides funding for the Department of Mental
Retardation (DMR) which operates homes and centers for
individuals with developmental delays. Increases or decreases to
these programs will reduce or improve the level of services
available to persons with developmental disabilities.</p>

<h2><a name="SECTION00052000000000000000" id=
"SECTION00052000000000000000">4.2 Mental Health</a></h2>

<p>This program provides funding for the Department of Mental
Health (DMH), which operates programs and facilities that treat
and assist persons with mental illness. Increases or decreases to
these programs will reduce or improve the level of services
available to persons with mental illness and in some cases may
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lead to increases in hospitalizations, injuries, and possibly
arrests.</p>

<h2><a name="SECTION00053000000000000000" id=
"SECTION00053000000000000000">4.3 Public Health</a></h2>

<p>The Department of Public Health runs numerous programs that
monitor and regulate matters that affect the overall public
health. These programs include monitoring the transmission of
diseases (for instance, the newly occurring cases of SARS [Severe
Acute Respiratory Syndrome]), the regulation of hospitals and
other health care institutions and professions, and the overall
coordination of public health issues as diverse as food safety
and bioterrorism.</p>

<h1><a name="SECTION00060000000000000000" id=
"SECTION00060000000000000000">5 Transportation</a></h1>

<p>This block contains programs which concern the quality of
public transportation, as well as the quality of roads &amp;
bridges in the state of Massachusetts. In addition, it helps to
fund the Massachusetts Bay Transportation Authority.</p>

<h2><a name="SECTION00061000000000000000" id=
"SECTION00061000000000000000">5.1 Massachusetts Highways</a></h2>

<p>Funding for this program affects the frequency and quality of
maintenance of the state's roads and bridges. Increases or
decreases in this area will affect the quality of the roads and
bridges and can have a direct impact on the safety and
convenience of drivers.</p>

<h2><a name="SECTION00062000000000000000" id=
"SECTION00062000000000000000">5.2 Registry of Motor
Vehicles</a></h2>

<p>Funding for the state's RMV offices allows residents
convenient access to license and registration renewal as well as
allowing the RMV to provide services that help ensure the safety
of vehicles on the road.</p>

<h1><a name="SECTION00070000000000000000" id=
"SECTION00070000000000000000">6 Government</a></h1>

<p>This block contains programs which help to fund not only the
state government, and all of its branches, but also to help fund
local governments, which maintain everything from playgrounds and
parks to water and sewers.</p>

<h2><a name="SECTION00071000000000000000" id=
"SECTION00071000000000000000">6.1 General Government</a></h2>

<p>This block of spending provides funds for general government
functions such as the executive branch, which administers the
government and appoints judges and other government personnel.
This block also funds officials who are in charge of government
finance (for instance, bonds issued by the state) and agencies
charged with guarding against government waste and abuse and the
monitoring and regulation of businesses and corporations located
in the state.</p>

<h2><a name="SECTION00072000000000000000" id=
"SECTION00072000000000000000">6.2 Local Government</a></h2>

<p>Funding for local governments provides everything from
maintenance of parks and playgrounds to local government services
such as water and sewer.</p>
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<h1><a name="SECTION00080000000000000000" id=
"SECTION00080000000000000000">7 Central Costs</a></h1>

<p>This block contains programs which help fund group health
insurance programs and State Employee pensions. It also helps
with debt services in the state of Massachusetts.</p>

<h2><a name="SECTION00081000000000000000" id=
"SECTION00081000000000000000">7.1 Employee Benefits</a></h2>

<p>Benefits include the cost of group health insurance programs,
teachers' pensions and State employees' pensions. All of these
are employment benefits common to employees throughout the state
and includes everyone who is an employee of the state, from a
janitor at a high school to a firefighter.</p>

<h2><a name="SECTION00082000000000000000" id=
"SECTION00082000000000000000">7.2 Debt Services</a></h2>

<p>The State's obligation for the payment of interest and
principal on certain bonded debt. Typically, the payment is
mandatory since the 'full faith and credit' of the Commonwealth
is pledged when the funds are borrowed. In simple terms, the
bondholders are in line ahead of other State expenditures for
programs.</p>

<h1><a name="SECTION00090000000000000000" id=
"SECTION00090000000000000000">8 Economic Development</a></h1>

<p>This block contains programs which help to support the
Department of Environmental Management and the Department of
Environmental Protection by helping to enforce such laws as the
clean air and clean water laws. Also, these programs help
regulate central business activity, and support the unemployment
trust fund.</p>

<h2><a name="SECTION00091000000000000000" id=
"SECTION00091000000000000000">8.1 Business and Labor</a></h2>

<p>This program includes funding for agencies that regulate
certain business activities and professions (everything from
plumbers to accountants) and provides for worker training and
other forms of assistance such as administering the workers
compensation system and the unemployment trust fund.</p>

<h2><a name="SECTION00092000000000000000" id=
"SECTION00092000000000000000">8.2 Environment</a></h2>

<p>This program provides funding for environmental protection and
management. The DEM (Department of Environmental Management) and
the DEP (Department of Environmental Protection) enforce the
clean air and water laws, and manage state parks and wilderness
to help protect open space and wildlife.</p>

<h1><a name="SECTION00010000000000000000" id=
"SECTION00010000000000000000">9 Public Safety</a></h1>

<p>This block contains programs which help pay for law
enforcement agents and law makers. These programs ensure swift
and efficient justice in the state of Massachusetts.</p>

<h2><a name="SECTION00010100000000000000" id=
"SECTION00010100000000000000">9.1 Corrections</a></h2>

<p>This program under criminal justice operates and maintains the
prison system. Increases or decreases in this program affect the
salaries of prison employees and the level of services and
facilities available for inmates.</p>
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    <h2><a name="SECTION00010200000000000000" id=
    "SECTION00010200000000000000">9.2 Judiciary</a></h2>

    <p>This program is for the state court system where all civil and
    criminal matters are adjudicated. Increases or decreases in this
    program affect the number of employees working within the court
    system, and consequently the speed with which civil and criminal
    matters are disposed of by a court.</p>

    <h2><a name="SECTION00010300000000000000" id=
    "SECTION00010300000000000000">9.3 Police</a></h2>

    <p>Funding for local and state police affects the level of
    protection available for residents. Increases or decreases in
    this program may mean fewer police can be employed in each city
    or town and may, over time, affect the overall crime rate.</p>

    <h2><a name="SECTION00010400000000000000" id=
    "SECTION00010400000000000000">9.4 District Attorney</a></h2>

    <p>The state's district attorneys (which are elected in each
    county) prosecute individuals accused of crimes. Increases or
    decreases in this area may effect the speed and efficiency of
    such prosecutions, and in extreme cases of under funding, may
    result in some crimes not being prosecuted.</p>

    <h2><a name="SECTION00010500000000000000" id=
    "SECTION00010500000000000000">9.5 Attorney General</a></h2>

    <p>The state's attorney general enforces numerous criminal laws
    that range from environmental pollution crimes to the prosecution
    of organized crime figures as well as many civil laws such as
    consumer protection laws.</p>

    <h2><a name="SECTION00010600000000000000" id=
    "SECTION00010600000000000000">9.6 Fire Services</a></h2>

    <p>Funding local and state fire department services affects how
    well cities, towns and the state can respond to fires and other
    disasters.</p>

</div>
</body>
</html>
```

Ledger for info source

Listing C.11: `ledger.html`

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  <meta name="GENERATOR" content="OpenOffice.org 1.1.4 (Linux)">
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</head>

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        <b>Taxes</b></td>

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        <td colspan="3" width="409" align="center">
        <b>Expenses</b></td>
      </tr>

      <tr>
        <td colspan="2" rowspan="2" height="37" align="center">
        <b>Dynamic Taxes</b></td>

        <td align="left" bgcolor="#666666"><br></td>

        <td colspan="3" rowspan="2" align="center"><b>Education and
        Children</b></td>
      </tr>

      <tr>
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      </tr>

      <tr>
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```

```
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        <td align="left" bgcolor="#666666"><br></td>

        <td align="left">Education Local Aid</td>

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      <tr>
        <td height="18" align="right">Sales</td>

        <td align="right" sdval="3025200000" sdnum=
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        <td align="left">Higher Education</td>

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        <td align="right" sdval="0.157808235702115" sdnum=
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        <td align="left">Services to Children</td>

        <td align="right" sdval="709100000" sdnum=
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        $709,100,000.00</td>

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        <td align="left">Youth Services</td>

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        $134,800,000.00</td>

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```

```
        "1033;0;0.0%">2.0%</td>
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        <b>Static Taxes</b></td>

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        <td align="left">Child Care Services</td>

        <td align="right" sdval="398400000" sdnum=
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        <td align="left"><b>Subtotal</b></td>

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        $65,000,000.00</td>

        <td align="left" bgcolor="#666666"><br></td>

        <td colspan="3" rowspan="2" align="center"><b>Assistance to
        Poor</b></td>
      </tr>

      <tr>
        <td height="18" align="right">Bank</td>

        <td align="right" sdval="210400000" sdnum=
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        $210,400,000.00</td>

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      <tr>
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        <td align="left">Medicaid</td>

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        <td height="18" align="right">Corporation</td>

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        <td align="left">Cash Assistance</td>

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        <td align="left">Housing Assistance</td>

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```

```
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```

```
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        <td height="18" align="right">Inter-fund transfers</td>

        <td align="right" sdval="1597600000" sdnum=
        "1033;0;[$$-409]#,##0.00;[RED]-[$$-409]#,##0.00">
        $1,597,600,000.00</td>

        <td align="left" bgcolor="#666666"><br></td>

        <td align="left">Public Health</td>

        <td align="right" sdval="434100000" sdnum=
        "1033;0;[$$-409]#,##0.00;[RED]-[$$-409]#,##0.00">
        $434,100,000.00</td>

        <td align="right" sdval="0.201766209621195" sdnum=
        "1033;0;0.0%">20.2%</td>
      </tr>

      <tr>
        <td height="18" align="right"><b>Subtotal</b></td>

        <td align="right" sdval="9996200000" sdnum=
        "1033;0;[$$-409]#,##0.00;[RED]-[$$-409]#,##0.00">
        <b>$9,996,200,000.00</b></td>

        <td align="left" bgcolor="#666666"><br></td>

        <td align="left"><b>Subtotal</b></td>

        <td align="right" sdval="2151500000" sdnum=
        "1033;0;[$$-409]#,##0.00;[RED]-[$$-409]#,##0.00">
        <b>$2,151,500,000.00</b></td>

        <td align="right" sdval="0.0873812038014783" sdnum=
        "1033;0;0.0%"><b>8.7%</b></td>
      </tr>

      <tr>
        <td height="18" align="right"><b><br></b></td>

        <td align="left"><br></td>

        <td align="left" bgcolor="#666666"><br></td>

        <td colspan="3" rowspan="2" align="center">
        <b>Transportation</b></td>
      </tr>

      <tr>
        <td height="18" align="right"><b>Total Income</b></td>

        <td align="right" sdval="21719900000" sdnum=
        "1033;0;[$$-409]#,##0.00;[RED]-[$$-409]#,##0.00">
        <b>$21,719,900,000.00</b></td>

        <td align="left" bgcolor="#666666"><br></td>
      </tr>

      <tr>
```

```
        <td height="18" align="left"><br></td>

        <td align="left"><br></td>

        <td align="left" bgcolor="#666666"><br></td>

        <td align="left">Regional Transit</td>

        <td align="right" sdval="47800000" sdnum=
        "1033;0;[$$-409]#,##0.00;[RED]-[$$-409]#,##0.00">
        $47,800,000.00</td>

        <td align="right" sdval="0.204623287671233" sdnum=
        "1033;0;0.0%">20.5%</td>
      </tr>

      <tr>
        <td height="18" align="left"><br></td>

        <td align="left"><br></td>

        <td align="left" bgcolor="#666666"><br></td>

        <td align="left">Massachusetts Highways</td>

        <td align="right" sdval="115200000" sdnum=
        "1033;0;[$$-409]#,##0.00;[RED]-[$$-409]#,##0.00">
        $115,200,000.00</td>

        <td align="right" sdval="0.493150684931507" sdnum=
        "1033;0;0.0%">49.3%</td>
      </tr>

      <tr>
        <td height="18" align="left"><br></td>

        <td align="left"><br></td>

        <td align="left" bgcolor="#666666"><br></td>

        <td align="left">Registry of Motor Vehicles</td>

        <td align="right" sdval="70600000" sdnum=
        "1033;0;[$$-409]#,##0.00;[RED]-[$$-409]#,##0.00">
        $70,600,000.00</td>

        <td align="right" sdval="0.30222602739726" sdnum=
        "1033;0;0.0%">30.2%</td>
      </tr>

      <tr>
        <td height="18" align="left"><br></td>

        <td align="left"><br></td>

        <td align="left" bgcolor="#666666"><br></td>

        <td align="left"><b>Subtotal</b></td>

        <td align="right" sdval="233600000" sdnum=
        "1033;0;[$$-409]#,##0.00;[RED]-[$$-409]#,##0.00">
        <b>$233,600,000.00</b></td>

        <td align="right" sdval="0.00948745024774592" sdnum=
        "1033;0;0.0%"><b>0.9%</b></td>
      </tr>

      <tr>
```

```
        <td height="18" align="left"><br></td>

        <td align="left"><br></td>

        <td align="left" bgcolor="#666666"><br></td>

        <td colspan="3" rowspan="2" align="center">
        <b>Government</b></td>
      </tr>

      <tr>
        <td height="18" align="left"><br></td>

        <td align="left"><br></td>

        <td align="left" bgcolor="#666666"><br></td>
      </tr>

      <tr>
        <td height="18" align="left"><br></td>

        <td align="left"><br></td>

        <td align="left" bgcolor="#666666"><br></td>

        <td align="left">General Government</td>

        <td align="right" sdval="662300000" sdnum=
        "1033;0;[$$-409]#,##0.00;[RED]-[$$-409]#,##0.00">
        $662,300,000.00</td>

        <td align="right" sdval="0.32095953477102" sdnum=
        "1033;0;0.0%">32.1%</td>
      </tr>

      <tr>
        <td height="18" align="left"><br></td>

        <td align="left"><br></td>

        <td align="left" bgcolor="#666666"><br></td>

        <td align="left">Local Government</td>

        <td align="right" sdval="1401200000" sdnum=
        "1033;0;[$$-409]#,##0.00;[RED]-[$$-409]#,##0.00">
        $1,401,200,000.00</td>

        <td align="right" sdval="0.67904046522898" sdnum=
        "1033;0;0.0%">67.9%</td>
      </tr>

      <tr>
        <td height="18" align="left"><br></td>

        <td align="left"><br></td>

        <td align="left" bgcolor="#666666"><br></td>

        <td align="left"><b>Subtotal</b></td>

        <td align="right" sdval="2063500000" sdnum=
        "1033;0;[$$-409]#,##0.00;[RED]-[$$-409]#,##0.00">
        <b>$2,063,500,000.00</b></td>

        <td align="right" sdval="0.0838071643245878" sdnum=
        "1033;0;0.0%"><b>8.4%</b></td>
      </tr>
```

```
      <tr>
        <td height="18" align="left"><br></td>

        <td align="left"><br></td>

        <td align="left" bgcolor="#666666"><br></td>

        <td colspan="3" rowspan="2" align="center"><b>Central
        Costs</b></td>
      </tr>

      <tr>
        <td height="18" align="left"><br></td>

        <td align="left"><br></td>

        <td align="left" bgcolor="#666666"><br></td>
      </tr>

      <tr>
        <td height="18" align="left"><br></td>

        <td align="left"><br></td>

        <td align="left" bgcolor="#666666"><br></td>

        <td align="left">Employee Benefits</td>

        <td align="right" sdval="1727100000" sdnum=
        "1033;0;[$$-409]#,##0.00;[RED]-[$$-409]#,##0.00">
        $1,727,100,000.00</td>

        <td align="right" sdval="0.519960260115607" sdnum=
        "1033;0;0.0%">52.0%</td>
      </tr>

      <tr>
        <td height="18" align="left"><br></td>

        <td align="left"><br></td>

        <td align="left" bgcolor="#666666"><br></td>

        <td align="left">Debt Services</td>

        <td align="right" sdval="1594500000" sdnum=
        "1033;0;[$$-409]#,##0.00;[RED]-[$$-409]#,##0.00">
        $1,594,500,000.00</td>

        <td align="right" sdval="0.480039739884393" sdnum=
        "1033;0;0.0%">48.0%</td>
      </tr>

      <tr>
        <td height="18" align="left"><br></td>

        <td align="left"><br></td>

        <td align="left" bgcolor="#666666"><br></td>

        <td align="left"><b>Subtotal</b></td>

        <td align="right" sdval="3321600000" sdnum=
        "1033;0;[$$-409]#,##0.00;[RED]-[$$-409]#,##0.00">
        <b>$3,321,600,000.00</b></td>

        <td align="right" sdval="0.134903744618634" sdnum=
```

```
        "1033;0;0.0%"><b>13.5%</b></td>
      </tr>

      <tr>
        <td height="18" align="left"><br></td>

        <td align="left"><br></td>

        <td align="left" bgcolor="#666666"><br></td>

        <td colspan="3" rowspan="2" align="center"><b>Economic
        Development</b></td>
      </tr>

      <tr>
        <td height="18" align="left"><br></td>

        <td align="left"><br></td>

        <td align="left" bgcolor="#666666"><br></td>
      </tr>

      <tr>
        <td height="18" align="left"><br></td>

        <td align="left"><br></td>

        <td align="left" bgcolor="#666666"><br></td>

        <td align="left">Business and Labor</td>

        <td align="right" sdval="118800000" sdnum=
        "1033;0;[$$-409]#,##0.00;[RED]-[$$-409]#,##0.00">
        $118,800,000.00</td>

        <td align="right" sdval="0.37511840858857" sdnum=
        "1033;0;0.0%">37.5%</td>
      </tr>

      <tr>
        <td height="18" align="left"><br></td>

        <td align="left"><br></td>

        <td align="left" bgcolor="#666666"><br></td>

        <td align="left">Environment</td>

        <td align="right" sdval="197900000" sdnum=
        "1033;0;[$$-409]#,##0.00;[RED]-[$$-409]#,##0.00">
        $197,900,000.00</td>

        <td align="right" sdval="0.62488159141143" sdnum=
        "1033;0;0.0%">62.5%</td>
      </tr>

      <tr>
        <td height="18" align="left"><br></td>

        <td align="left"><br></td>

        <td align="left" bgcolor="#666666"><br></td>

        <td align="left"><b>Subtotal</b></td>

        <td align="right" sdval="316700000" sdnum=
        "1033;0;[$$-409]#,##0.00;[RED]-[$$-409]#,##0.00">
        <b>$316,700,000.00</b></td>
```

```
          <td align="right" sdval="0.0128624807083096" sdnum=
          "1033;0;0.0%"><b>1.3%</b></td>
        </tr>

        <tr>
          <td height="18" align="left"><br></td>

          <td align="left"><br></td>

          <td align="left" bgcolor="#666666"><br></td>

          <td colspan="3" rowspan="2" align="center"><b>Public
          Safety</b></td>
        </tr>

        <tr>
          <td height="18" align="left"><br></td>

          <td align="left"><br></td>

          <td align="left" bgcolor="#666666"><br></td>
        </tr>

        <tr>
          <td height="18" align="left"><br></td>

          <td align="left"><br></td>

          <td align="left" bgcolor="#666666"><br></td>

          <td align="left">Corrections</td>

          <td align="right" sdval="890000000" sdnum=
          "1033;0;[$$-409]#,##0.00;[RED]-[$$-409]#,##0.00">
          $890,000,000.00</td>

          <td align="right" sdval="0.411313430076717" sdnum=
          "1033;0;0.0%">41.1%</td>
        </tr>

        <tr>
          <td height="18" align="left"><br></td>

          <td align="left"><br></td>

          <td align="left" bgcolor="#666666"><br></td>

          <td align="left">Judiciary</td>

          <td align="right" sdval="630100000" sdnum=
          "1033;0;[$$-409]#,##0.00;[RED]-[$$-409]#,##0.00">
          $630,100,000.00</td>

          <td align="right" sdval="0.291200665495887" sdnum=
          "1033;0;0.0%">29.1%</td>
        </tr>

        <tr>
          <td height="18" align="left"><br></td>

          <td align="left"><br></td>

          <td align="left" bgcolor="#666666"><br></td>

          <td align="left">Police</td>

          <td align="right" sdval="258600000" sdnum=
```

```
          "1033;0;[$$-409]#,##0.00;[RED]-[$$-409]#,##0.00">
          $258,600,000.00</td>

          <td align="right" sdval="0.119511969682965" sdnum=
          "1033;0;0.0%">12.0%</td>
        </tr>

        <tr>
          <td height="18" align="left"><br></td>

          <td align="left"><br></td>

          <td align="left" bgcolor="#666666"><br></td>

          <td align="left">District Attorney</td>

          <td align="right" sdval="84800000" sdnum=
          "1033;0;[$$-409]#,##0.00;[RED]-[$$-409]#,##0.00">
          $84,800,000.00</td>

          <td align="right" sdval="0.0391903133376467" sdnum=
          "1033;0;0.0%">3.9%</td>
        </tr>

        <tr>
          <td height="18" align="left"><br></td>

          <td align="left"><br></td>

          <td align="left" bgcolor="#666666"><br></td>

          <td align="left">Attorney General</td>

          <td align="right" sdval="35300000" sdnum=
          "1033;0;[$$-409]#,##0.00;[RED]-[$$-409]#,##0.00">
          $35,300,000.00</td>

          <td align="right" sdval="0.0163138922266383" sdnum=
          "1033;0;0.0%">1.6%</td>
        </tr>

        <tr>
          <td height="18" align="left"><br></td>

          <td align="left"><br></td>

          <td align="left" bgcolor="#666666"><br></td>

          <td align="left">Fire Services</td>

          <td align="right" sdval="265000000" sdnum=
          "1033;0;[$$-409]#,##0.00;[RED]-[$$-409]#,##0.00">
          $265,000,000.00</td>

          <td align="right" sdval="0.122469729180146" sdnum=
          "1033;0;0.0%">12.2%</td>
        </tr>

        <tr>
          <td height="18" align="left"><br></td>

          <td align="left"><br></td>

          <td align="left" bgcolor="#666666"><br></td>

          <td align="left"><b>Subtotal</b></td>

          <td align="right" sdval="2163800000" sdnum=
```

```
        "1033;0;[$$-409]#,##0.00;[RED]-[$$-409]#,##0.00">
        <b>$2,163,800,000.00</b></td>

        <td align="right" sdval="0.0878807570465437" sdnum=
        "1033;0;0.0%"><b>8.8%</b></td>
      </tr>

      <tr>
        <td height="18" align="left"><br></td>

        <td align="left"><br></td>

        <td align="left" bgcolor="#666666"><br></td>

        <td align="left"><br></td>

        <td align="left" sdnum=
        "1033;0;[$$-409]#,##0.00;[RED]-[$$-409]#,##0.00"><br></td>

        <td align="left" sdnum="1033;0;0.0%"><br></td>
      </tr>

      <tr>
        <td height="18" align="left"><br></td>

        <td align="left"><br></td>

        <td align="left" bgcolor="#666666"><br></td>

        <td align="left"><b>Total Expenditure</b></td>

        <td align="right" sdval="24622000000" sdnum=
        "1033;0;[$$-409]#,##0.00;[RED]-[$$-409]#,##0.00">
        <b>$24,622,000,000.00</b></td>

        <td align="left" sdnum="1033;0;0.0%"><br></td>
      </tr>

      <tr>
        <td height="18" align="left"><br></td>

        <td align="left"><br></td>

        <td align="left" bgcolor="#666666"><br></td>

        <td align="left"><br></td>

        <td align="left" sdnum=
        "1033;0;[$$-409]#,##0.00;[RED]-[$$-409]#,##0.00"><br></td>

        <td align="left" sdnum="1033;0;0.0%"><br></td>
      </tr>

      <tr>
        <td colspan="2" rowspan="4" height="73" align="center"
        valign="middle"><b>Net Gain/Loss</b></td>

        <td rowspan="4" align="left"><br></td>

        <td colspan="3" rowspan="4" align="center" valign="middle"
        sdval="-2902100000" sdnum=
        "1033;0;[$$-409]#,##0.00;[RED]-[$$-409]#,##0.00">
        <b>-$2,902,100,000.00</b></td>
      </tr>
    </tbody>
  </table>
  <!-- ************************************************************************ -->
</body>
```

```
</html>
```

MassBalance source introduction page

Listing C.12: `mb.html`

```
<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.01 Transitional//EN" "http://www.w3.org/TR/html4
    /loose.dtd">
<html>
<head>
    <title></title>
    <meta http-equiv="Content-Type" content="text/html; charset=iso-8859-1">
    <meta name="Author" content="Mike Lundy">
    <link rel="stylesheet" href="files/style.css" type="text/css">
    <script type="text/javascript" src="files/code.js"></script>
</head>
<body>
    <div style="width: 640px">
      <ul>
        <li>When you are ready, please click the "Continue" link below.</li>
        <li>You will be presented with a new window containing a game about the
            Massachusetts budget called MassBalance.</li>
        <li>Please play with
            MassBalance for 10 minutes<script type="text/javascript">until()</script>,
            then close that window and click the "Done" button.</li>
        <li>Do not close this window while you are playing,
            as you will have to start completely over.</li>

        <li><a href="http://www.fluffypenguin.org/mb/" target="blank">Continue</a></li>
      </ul>
      <div style="text-align: center">
        <br>
        <script type="text/javascript">click()</script>
        <form method="post" action="">
          <input type="hidden" name="time" value="TIME">
          <input type="hidden" name="id" value="SESSION">
          <input type="submit" value="Done">
          <input type="hidden" name="do" value="quiz">
        </form>
      </div>
    </div>
</body>
</html>
```

Quiz

Listing C.13: `quiz.html`

```
<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.01 Transitional//EN" "http://www.w3.org/TR/html4
    /loose.dtd">
<html>
<head>
    <title></title>
    <meta http-equiv="Content-Type" content="text/html; charset=iso-8859-1">
    <meta name="Author" content="Mike Lundy">
    <link rel="stylesheet" href="files/style.css" type="text/css">
  </head>
<body>
  <form method="post" action="">
    <input type="hidden" name="do" value="survey2">
    <input type="hidden" name="id" value="SESSION">
    <input type="hidden" name="chk" value="476160000">
    <table style="width: 700px;">
    <tr>
        <td colspan="2">
          <div style="font-weight: bold; padding-top: 10px; padding-bottom: 10px; text-
              align: left">
          <ul>
          <li>Now that you've been exposed to one of the sources, it's time to take
              the quiz.</li>
          <li>The quiz is closed book. Please do not consult any external source of
              information.</li>
          </ul>
          </div>
        </td>
    </tr>
    <tr><td class="r">What is most likely to happen if Massachusetts cuts Chapter 70
        funding?</td>
      <td>
        <input type="radio" name="
            whatismostlikelytohappenifmassachusettscutschapter70funding" value="1">
            Lawsuits from the poor<br>
        <input type="radio" name="
            whatismostlikelytohappenifmassachusettscutschapter70funding" value="2">Natural
             Disaster<br>
        <input type="radio" name="
            whatismostlikelytohappenifmassachusettscutschapter70funding" value="3">No
            gratis day care service<br>
        <input type="radio" name="
            whatismostlikelytohappenifmassachusettscutschapter70funding" value="4">
            Lawsuits from the rich<br>
      </td>
    </tr>
    <tr><td class="r">Support for educational and child-care programs typically makes up
        about what % of the total budget?</td>
      <td>
        <input type="radio" name="
            supportforeducationalandchildcareprogramstypicallymakesupaboutwhatofthetotalbudget
            " value="1">20%<br>
        <input type="radio" name="
            supportforeducationalandchildcareprogramstypicallymakesupaboutwhatofthetotalbudget
            " value="2">5%<br>
        <input type="radio" name="
            supportforeducationalandchildcareprogramstypicallymakesupaboutwhatofthetotalbudget
            " value="3">10%<br>
        <input type="radio" name="
            supportforeducationalandchildcareprogramstypicallymakesupaboutwhatofthetotalbudget
            " value="4">30%<br>
      </td>
    </tr>
    <tr><td class="r">Of these, Massachusetts makes the most money on</td>
```

```
      <td>
        <input type="radio" name="ofthesemassachusettsmakesthemostmoneyon" value="1">
            Estate tax<br>
        <input type="radio" name="ofthesemassachusettsmakesthemostmoneyon" value="2">
            Alcoholic Beverage tax<br>
        <input type="radio" name="ofthesemassachusettsmakesthemostmoneyon" value="3">Sales
             tax<br>
        <input type="radio" name="ofthesemassachusettsmakesthemostmoneyon" value="4">
            Federal Reimbursement tax<br>
      </td>
    </tr>
    <tr><td class="r">Approximately how many families are on state welfare?</td>
      <td>
        <input type="radio" name="approximatelyhowmanyfamiliesareonstatewelfare" value
            ="1">367,000<br>
        <input type="radio" name="approximatelyhowmanyfamiliesareonstatewelfare" value
            ="2">8,675,309<br>
        <input type="radio" name="approximatelyhowmanyfamiliesareonstatewelfare" value
            ="3">122,000<br>
        <input type="radio" name="approximatelyhowmanyfamiliesareonstatewelfare" value
            ="4">450,000<br>
      </td>
    </tr>
    <tr><td class="r">Chapter 70 funding exists to:</td>
      <td>
        <input type="radio" name="chapter70fundingexiststo" value="1">Support
            Massachusetts collages<br>
        <input type="radio" name="chapter70fundingexiststo" value="2">Help students get
            college loans<br>
        <input type="radio" name="chapter70fundingexiststo" value="3">Provide day care
            services to families on welfare<br>
        <input type="radio" name="chapter70fundingexiststo" value="4">Help ensure that
            local schools receive enough money<br>
      </td>
    </tr>
    <tr><td class="r">In 2000, how much did Massachusetts voters vote to decrease income
        tax?</td>
      <td>
        <input type="radio" name="
            in2000howmuchdidmassachusettsvotersvotetodecreaseincometax" value="1">.95%<br>
        <input type="radio" name="
            in2000howmuchdidmassachusettsvotersvotetodecreaseincometax" value="2">.89%<br>
        <input type="radio" name="
            in2000howmuchdidmassachusettsvotersvotetodecreaseincometax" value="3">1.4%<br>
        <input type="radio" name="
            in2000howmuchdidmassachusettsvotersvotetodecreaseincometax" value="4">1.2%<br>
      </td>
    </tr>
    <tr><td class="r">Which is not a static tax?</td>
      <td>
        <input type="radio" name="whichisnotastatictax" value="1">Gas Tax<br>
        <input type="radio" name="whichisnotastatictax" value="2">Corporation Tax<br>
        <input type="radio" name="whichisnotastatictax" value="3">Bank Tax<br>
        <input type="radio" name="whichisnotastatictax" value="4">Alcoholic Beverage Tax<
            br>
      </td>
    </tr>
    <tr><td class="r">The Massachusetts state expenses were what % over the income in
        2003?</td>
      <td>
        <input type="radio" name="themassachusettsstateexpenseswerewhatovertheincomein2003
            " value="1">15%<br>
        <input type="radio" name="themassachusettsstateexpenseswerewhatovertheincomein2003
            " value="2">13%<br>
        <input type="radio" name="themassachusettsstateexpenseswerewhatovertheincomein2003
            " value="3">18%<br>
        <input type="radio" name="themassachusettsstateexpenseswerewhatovertheincomein2003
            " value="4">20%<br>
```

```
      </td>
    </tr>
    <tr><td class="r">Personal income tax is currently:</td>
      <td>
        <input type="radio" name="personalincometaxiscurrently" value="1">5.3%<br>
        <input type="radio" name="personalincometaxiscurrently" value="2">5.0%<br>
        <input type="radio" name="personalincometaxiscurrently" value="3">5.6%<br>
        <input type="radio" name="personalincometaxiscurrently" value="4">5.95%<br>
      </td>
    </tr>
    <tr><td class="r">The bulk of the money earmarked for "assistance to poor" goes toward
        </td>
      <td>
        <input type="radio" name="thebulkofthemoneyearmarkedforassistancetopoorgoestoward"
             value="1">Cash assistance<br>
        <input type="radio" name="thebulkofthemoneyearmarkedforassistancetopoorgoestoward"
             value="2">Medicade<br>
        <input type="radio" name="thebulkofthemoneyearmarkedforassistancetopoorgoestoward"
             value="3">Elderly<br>
        <input type="radio" name="thebulkofthemoneyearmarkedforassistancetopoorgoestoward"
             value="4">Housing assistance<br>
      </td>
    </tr>
    <tr><td class="r">AFDC is</td>
      <td>
        <input type="radio" name="afdcis" value="1">Housing program for the elderly<br>
        <input type="radio" name="afdcis" value="2">Public health office<br>
        <input type="radio" name="afdcis" value="3">Child care service<br>
        <input type="radio" name="afdcis" value="4">Welfare<br>
      </td>
    </tr>
    <tr><td class="r">Most people agree that sales tax affects which group the most?</td>
      <td>
        <input type="radio" name="mostpeopleagreethatsalestaxaffectswhichgroupthemost"
            value="1">Middle-class<br>
        <input type="radio" name="mostpeopleagreethatsalestaxaffectswhichgroupthemost"
            value="2">Working-class<br>
        <input type="radio" name="mostpeopleagreethatsalestaxaffectswhichgroupthemost"
            value="3">Upper-class<br>
        <input type="radio" name="mostpeopleagreethatsalestaxaffectswhichgroupthemost"
            value="4">White-collar<br>
      </td>
    </tr>
    <tr><td class="r">Massachusetts tends to make more on</td>
      <td>
        <input type="radio" name="massachusettstendstomakemoreon" value="1">Dynamic Taxes<
            br>
        <input type="radio" name="massachusettstendstomakemoreon" value="2">Static Taxes<
            br>
      </td>
    </tr>
    <tr><td class="r">The budget deficit for 2003 was</td>
      <td>
        <input type="radio" name="thebudgetdeficitfor2003was" value="1">$2.4 billion<br>
        <input type="radio" name="thebudgetdeficitfor2003was" value="2">$4.1 billion<br>
        <input type="radio" name="thebudgetdeficitfor2003was" value="3">$3.2 billion<br>
        <input type="radio" name="thebudgetdeficitfor2003was" value="4">$3.5 billion<br>
      </td>
    </tr>
    <tr><td class="r">How much reimbursement does Massachusetts receive from the federal
        government for money spent on state Medicaid?</td>
      <td>
        <input type="radio" name="
            howmuchreimbursementdoesmassachusettsreceivefromthefederalgovernmentformoneyspentonstatemedica
            " value="1">85%<br>
        <input type="radio" name="
            howmuchreimbursementdoesmassachusettsreceivefromthefederalgovernmentformoneyspentonstatemedica
            " value="2">25%<br>
```

```
        <input type="radio" name="
            howmuchreimbursementdoesmassachusettsreceivefromthefederalgovernmentformoneyspentonstatemedica
            " value="3">33%<br>
        <input type="radio" name="
            howmuchreimbursementdoesmassachusettsreceivefromthefederalgovernmentformoneyspentonstatemedica
            " value="4">50%<br>
      </td>
    </tr>
    <tr><td class="r">What is Massachusetts' Medicaid program called?</td>
      <td>
        <input type="radio" name="whatismassachusettsmedicaidprogramcalled" value="1">
            MassCare<br>
        <input type="radio" name="whatismassachusettsmedicaidprogramcalled" value="2">
            Medicaid<br>
        <input type="radio" name="whatismassachusettsmedicaidprogramcalled" value="3">
            Medicare<br>
        <input type="radio" name="whatismassachusettsmedicaidprogramcalled" value="4">
            MassHealth<br>
      </td>
    </tr>
    <tr><td colspan="2" style="text-align: center"><input type="submit" value="Submit"></
        td></tr>
  </table>
  </form>
</body>
</html>
```

Pre-survey

Listing C.14: `survey.html`

```
<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.01 Transitional//EN" "http://www.w3.org/TR/html4
    /loose.dtd">
<html>
<head>
    <title></title>
    <meta http-equiv="Content-Type" content="text/html; charset=iso-8859-1">
    <meta name="Author" content="Mike Lundy">
    <link rel="stylesheet" href="files/style.css" type="text/css">
  </head>
<body>
  <form method="post" action="">
    <input type="hidden" name="do" value="SOURCE">
    <input type="hidden" name="id" value="SESSION">
    <table style="width: 700px;">
      <tr>
        <td colspan="2">
          <div style="font-weight: bold; padding-top: 10px; padding-bottom: 10px; text-
              align: center">
            First, we need to get some basic demographic information.<br>Please
            answer every question to the best of your knowledge.</div>
        </td>
      </tr>
      <tr><td class="r">Graduation Year</td>
        <td>
          <select name="year">
            <option value="1900">1900</option>
            <option value="1901">1901</option>
            <option value="1902">1902</option>
            <option value="1903">1903</option>
            <option value="1904">1904</option>
            <option value="1905">1905</option>
            <option value="1906">1906</option>
            <option value="1907">1907</option>
            <option value="1908">1908</option>
            <option value="1909">1909</option>
            <option value="1910">1910</option>
            <option value="1911">1911</option>
            <option value="1912">1912</option>
            <option value="1913">1913</option>
            <option value="1914">1914</option>
            <option value="1915">1915</option>
            <option value="1916">1916</option>
            <option value="1917">1917</option>
            <option value="1918">1918</option>
            <option value="1919">1919</option>
            <option value="1920">1920</option>
            <option value="1921">1921</option>
            <option value="1922">1922</option>
            <option value="1923">1923</option>
            <option value="1924">1924</option>
            <option value="1925">1925</option>
            <option value="1926">1926</option>
            <option value="1927">1927</option>
            <option value="1928">1928</option>
            <option value="1929">1929</option>
            <option value="1930">1930</option>
            <option value="1931">1931</option>
            <option value="1932">1932</option>
            <option value="1933">1933</option>
            <option value="1934">1934</option>
            <option value="1935">1935</option>
            <option value="1936">1936</option>
            <option value="1937">1937</option>
```

```
            <option value="1938">1938</option>
            <option value="1939">1939</option>
            <option value="1940">1940</option>
            <option value="1941">1941</option>
            <option value="1942">1942</option>
            <option value="1943">1943</option>
            <option value="1944">1944</option>
            <option value="1945">1945</option>
            <option value="1946">1946</option>
            <option value="1947">1947</option>
            <option value="1948">1948</option>
            <option value="1949">1949</option>
            <option value="1950">1950</option>
            <option value="1951">1951</option>
            <option value="1952">1952</option>
            <option value="1953">1953</option>
            <option value="1954">1954</option>
            <option value="1955">1955</option>
            <option value="1956">1956</option>
            <option value="1957">1957</option>
            <option value="1958">1958</option>
            <option value="1959">1959</option>
            <option value="1960">1960</option>
            <option value="1961">1961</option>
            <option value="1962">1962</option>
            <option value="1963">1963</option>
            <option value="1964">1964</option>
            <option value="1965">1965</option>
            <option value="1966">1966</option>
            <option value="1967">1967</option>
            <option value="1968">1968</option>
            <option value="1969">1969</option>
            <option value="1970">1970</option>
            <option value="1971">1971</option>
            <option value="1972">1972</option>
            <option value="1973">1973</option>
            <option value="1974">1974</option>
            <option value="1975">1975</option>
            <option value="1976">1976</option>
            <option value="1977">1977</option>
            <option value="1978">1978</option>
            <option value="1979">1979</option>
            <option value="1980">1980</option>
            <option value="1981">1981</option>
            <option value="1982">1982</option>
            <option value="1983">1983</option>
            <option value="1984">1984</option>
            <option value="1985">1985</option>
            <option value="1986">1986</option>
            <option value="1987">1987</option>
            <option value="1988">1988</option>
            <option value="1989">1989</option>
            <option value="1990">1990</option>
            <option value="1991">1991</option>
            <option value="1992">1992</option>
            <option value="1993">1993</option>
            <option value="1994">1994</option>
            <option value="1995">1995</option>
            <option value="1996">1996</option>
            <option value="1997">1997</option>
            <option value="1998">1998</option>
            <option value="1999">1999</option>
            <option value="2000">2000</option>
            <option value="2001">2001</option>
            <option value="2002">2002</option>
            <option value="2003">2003</option>
            <option value="2004">2004</option>
            <option value="2005" selected="selected">2005</option>
```

```
            <option value="2006">2006</option>
            <option value="2007">2007</option>
            <option value="2008">2008</option>
            <option value="2009">2009</option>
            <option value="2010">2010</option>
            <option value="2011">2011</option>
            <option value="2012">2012</option>
            <option value="2013">2013</option>
            <option value="2014">2014</option>
            <option value="2015">2015</option>
          </select>
        </td>
      </tr>
      <tr><td class="r">Major(s)</td>
        <td>
          <select name="major1">
            <option value=""></option>
            <option value="Actuarial Mathematics">Actuarial Mathematics</option>
            <option value="Aerospace Engineering">Aerospace Engineering</option>
            <option value="Biology">Biology</option>
            <option value="Biology &amp; Biotechnology">Biology &amp; Biotechnology</option>
            <option value="Biochemistry">Biochemistry</option>
            <option value="Biomedical Engineering">Biomedical Engineering</option>
            <option value="Biotechnology">Biotechnology</option>
            <option value="Computers with Applications">Computers with Applications</option>
            <option value="Civil Engineering">Civil Engineering</option>
            <option value="Chemical Engineering">Chemical Engineering</option>
            <option value="Chemistry">Chemistry</option>
            <option value="Computer Science">Computer Science</option>
            <option value="Economics">Economics</option>
            <option value="Electrical &amp; Computer Engineering">Electrical &amp; Computer
                Engineering</option>
            <option value="Electrical Engineering">Electrical Engineering</option>
            <option value="Engineering Physics">Engineering Physics</option>
            <option value="Environmental Engineering">Environmental Engineering</option>
            <option value="Environmental Policy &amp; Development">Environmental Policy &amp
                ; Development </option>
            <option value="Economics &amp; Technology">Economics &amp; Technology</option>
            <option value="Humanities &amp; Arts">Humanities &amp; Arts</option>
            <option value="Industrial Engineering">Industrial Engineering</option>
            <option value="IMGD">Interactive Media and Game Development</option>
            <option value="Interdisciplinary">Interdisciplinary</option>
            <option value="International Studies">International Studies</option>
            <option value="Mathematical Sciences">Mathematical Sciences</option>
            <option value="Mechanical Engineering">Mechanical Engineering</option>
            <option value="Manufacturing Engineering">Manufacturing Engineering</option>
            <option value="Management">Management</option>
            <option value="Management Engineering">Management Engineering</option>
            <option value="Management Information Systems">Management Information Systems</
                option>
            <option value="Other">Other</option>
            <option value="Physics">Physics</option>
            <option value="Society, Technology &amp; Policy">Society, Technology &amp;
                Policy</option>
            <option value="System Dynamics">System Dynamics</option>
            <option value="Tech, Sci &amp; Prof Communication">Tech, Sci &amp; Prof
                Communication</option>
          </select><br>
          <select name="major2">
            <option value=""></option>
            <option value="Actuarial Mathematics">Actuarial Mathematics</option>
            <option value="Aerospace Engineering">Aerospace Engineering</option>
            <option value="Biology">Biology</option>
            <option value="Biology &amp; Biotechnology">Biology &amp; Biotechnology</option>
            <option value="Biochemistry">Biochemistry</option>
            <option value="Biomedical Engineering">Biomedical Engineering</option>
            <option value="Biotechnology">Biotechnology</option>
            <option value="Computers with Applications">Computers with Applications</option>
```

```
          <option value="Civil Engineering">Civil Engineering</option>
          <option value="Chemical Engineering">Chemical Engineering</option>
          <option value="Chemistry">Chemistry</option>
          <option value="Computer Science">Computer Science</option>
          <option value="Economics">Economics</option>
          <option value="Electrical &amp; Computer Engineering">Electrical &amp; Computer
              Engineering</option>
          <option value="Electrical Engineering">Electrical Engineering</option>
          <option value="Engineering Physics">Engineering Physics</option>
          <option value="Environmental Engineering">Environmental Engineering</option>
          <option value="Environmental Policy &amp; Development">Environmental Policy &amp
              ; Development </option>
          <option value="Economics &amp; Technology">Economics &amp; Technology</option>
          <option value="Humanities &amp; Arts">Humanities &amp; Arts</option>
          <option value="Industrial Engineering">Industrial Engineering</option>
          <option value="IMGD">Interactive Media and Game Development</option>
          <option value="Interdisciplinary">Interdisciplinary</option>
          <option value="International Studies">International Studies</option>
          <option value="Mathematical Sciences">Mathematical Sciences</option>
          <option value="Mechanical Engineering">Mechanical Engineering</option>
          <option value="Manufacturing Engineering">Manufacturing Engineering</option>
          <option value="Management">Management</option>
          <option value="Management Engineering">Management Engineering</option>
          <option value="Management Information Systems">Management Information Systems</
              option>
          <option value="Other">Other</option>
          <option value="Physics">Physics</option>
          <option value="Society, Technology &amp; Policy">Society, Technology &amp;
              Policy</option>
          <option value="System Dynamics">System Dynamics</option>
          <option value="Tech, Sci &amp; Prof Communication">Tech, Sci &amp; Prof
              Communication</option>
        </select>
      </td>
    </tr>
    <tr><td class="r">Gender</td>
      <td><select name="gender">
            <option value="male">Male</option>
            <option value="female">Female</option>
            <option value="-----" selected="selected">-----</option>
          </select></td>
    </tr>
    <tr><td class="r">How responsible are you for your own finances?</td>
      <td>
        Not at All
        <input type="radio" name="ownfin" value="1">
        <input type="radio" name="ownfin" value="2">
        <input type="radio" name="ownfin" value="3">
        <input type="radio" name="ownfin" value="4">
        <input type="radio" name="ownfin" value="5">
        Completely
    </td></tr>
    <tr><td class="r">How knowledgeable are you about personal budgeting and finance?</td>
      <td>
        Not at All
        <input type="radio" name="perbud" value="1">
        <input type="radio" name="perbud" value="2">
        <input type="radio" name="perbud" value="3">
        <input type="radio" name="perbud" value="4">
        <input type="radio" name="perbud" value="5">
        Completely
    </td></tr>
    <tr><td class="r">How knowledgeable are you about governmental budgeting and finance
        ?</td>
      <td>
        Not at All
        <input type="radio" name="govbud" value="1">
        <input type="radio" name="govbud" value="2">
```

```
        <input type="radio" name="govbud" value="3">
        <input type="radio" name="govbud" value="4">
        <input type="radio" name="govbud" value="5">
        Completely
    </td></tr>
    <tr><td class="r">How often have you been exposed to games as learning tools in the
        past?</td>
      <td>
        Never
        <input type="radio" name="pastgame" value="1">
        <input type="radio" name="pastgame" value="2">
        <input type="radio" name="pastgame" value="3">
        <input type="radio" name="pastgame" value="4">
        <input type="radio" name="pastgame" value="5">
        Every Day
    </td></tr>
    <tr><td class="r">If you have, could you name a few?</td>
      <td><textarea name="pastgamenames" rows="3" cols="40"></textarea></td>
    </tr>
    <tr><td class="r">How capable are you of learning from a game?</td>
      <td>
        Not at All
        <input type="radio" name="canlearn" value="1">
        <input type="radio" name="canlearn" value="2">
        <input type="radio" name="canlearn" value="3">
        <input type="radio" name="canlearn" value="4">
        <input type="radio" name="canlearn" value="5">
        Completely
    </td></tr>
    <tr><td colspan="2" style="text-align: center"><input type="submit" value="Submit"></
        td></tr>
  </table>
  </form>
</body>
</html>
```

Post-survey

Listing C.15: `survey2.html`

```
<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.01 Transitional//EN" "http://www.w3.org/TR/html4
    /loose.dtd">
<html>
<head>
    <title></title>
    <meta http-equiv="Content-Type" content="text/html; charset=iso-8859-1">
    <meta name="Author" content="Mike Lundy">
    <link rel="stylesheet" href="files/style.css" type="text/css">
  </head>
<body>
  <form method="post" action="">
    <input type="hidden" name="do" value="done">
    <input type="hidden" name="id" value="SESSION">
    <table style="width: 700px;">
      <tr>
        <td colspan="2">
          <div style="font-weight: bold; padding-top: 10px; padding-bottom: 10px; text-
              align: center">
            Almost done! Just one more quick survey.<br>Please
            answer every question to the best of your knowledge.</div>
        </td>
      </tr>
      <tr><td class="r">How much effort would you say you put into the quiz?</td>
        <td>
          Not Much
          <input type="radio" name="effort" value="1">
          <input type="radio" name="effort" value="2">
          <input type="radio" name="effort" value="3">
          <input type="radio" name="effort" value="4">
          <input type="radio" name="effort" value="5">
          Quite A Bit
        </td>
      </tr>
      <tr><td class="r">How entertained were you by the source?</td>
        <td>
          Not at All
          <input type="radio" name="entertained" value="1">
          <input type="radio" name="entertained" value="2">
          <input type="radio" name="entertained" value="3">
          <input type="radio" name="entertained" value="4">
          <input type="radio" name="entertained" value="5">
          Completely
        </td>
      </tr>
      <tr><td class="r">How engaged were you by the source?</td>
        <td>
          Not at All
          <input type="radio" name="engaged" value="1">
          <input type="radio" name="engaged" value="2">
          <input type="radio" name="engaged" value="3">
          <input type="radio" name="engaged" value="4">
          <input type="radio" name="engaged" value="5">
          Completely
        </td>
      </tr>
      <tr><td class="r">How satisfied were you by the source?</td>
        <td>
          Not at All
          <input type="radio" name="satisfied" value="1">
          <input type="radio" name="satisfied" value="2">
          <input type="radio" name="satisfied" value="3">
          <input type="radio" name="satisfied" value="4">
          <input type="radio" name="satisfied" value="5">
```

```
          Completely
        </td>
      </tr>
      <tr><td class="r">How do you think you did on the quiz?</td>
        <td>
          Badly
          <input type="radio" name="quizguess" value="1">
          <input type="radio" name="quizguess" value="2">
          <input type="radio" name="quizguess" value="3">
          <input type="radio" name="quizguess" value="4">
          <input type="radio" name="quizguess" value="5">
          Quite Well
        </td>
      </tr>
      <tr><td class="r">Now that you've had a chance to learn, how knowledgeable are you
          about governmental budgeting and finance?</td>
        <td>
          Not at All
          <input type="radio" name="govbudpost" value="1">
          <input type="radio" name="govbudpost" value="2">
          <input type="radio" name="govbudpost" value="3">
          <input type="radio" name="govbudpost" value="4">
          <input type="radio" name="govbudpost" value="5">
          Completely
        </td>
      </tr>
      <tr><td class="r">Do you have any comments?</td>
        <td><textarea name="comments" rows="8" cols="40" style="width: 98%"></textarea></
            td>
      </tr>
      <tr>
        <td colspan="2">
          Do you wish to enter a drawing for a $50 gift
          certificate to Best Buy? If so, please put your email address here.
          <input type="text" name="email">
          <br><br>
          <i><small>
            Privacy statement: At no point will your email address or other
            identifying information be associated in any way with your
            demographic information or any other information gathered during
            this study. Your address will not be shared with any third
            party, and will only be used to contact you if you win.
          </small></i>
          <br>
        </td>
      </tr>
      <tr><td colspan="2" style="text-align: center"><input type="submit" value="Submit
          "></td></tr>
  </table>
  </form>
</body>
</html>
```

Thank-you page

Listing C.16: `thanks.html`

```
<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.01 Transitional//EN" "http://www.w3.org/TR/html4
    /loose.dtd">
<html>
<head>
    <title></title>
    <meta http-equiv="Content-Type" content="text/html; charset=iso-8859-1">
    <meta name="Author" content="Mike Lundy">
    <link rel="stylesheet" href="files/style.css" type="text/css">
</head>
<body>
    <div style="width: 640px">
      <p>Thanks for participating!</p>
    </div>
</body>
</html>
```

A sample data file output from index.cgi

Listing C.17: `sample-data`

```
timestart=1114734712
ip=xxx.xxx.xxx.xxx
id=QnGAeILX7yMAAAVX5qw
source=s_info
timesurvey=1114734719
timesource=1114734790
surveydata={'canlearn' => '5', 'major1' => 'Computer Science', 'perbud' => '3',
            'do' => 's_info', 'ownfin' => '4', 'major2' => '', 'govbud' => '2',
            'pastgame' => '2', 'pastgamenames' => 'Math Blaster', 'id' =>
            'QnGAeILX7yMAAAVX5qw', 'year' => '2006', 'gender' => 'male'}
timequiz=1114735386
quizdata={'massachusettstendstomakemoreon' => '2', 'afdcis' => '3',
          'chapter70fundingexiststo' => '4',
          'whatismassachusettsmedicaidprogramcalled' => '4', 'chk' =>
          '476160000', 'do' => 'survey2', 'thebudgetdeficitfor2003was' => '1',
          'themassachusettsstateexpenseswerewhatovertheincomein2003' => '1',
          'mostpeopleagreethatsalestaxaffectswhichgroupthemost' => '2',
          'howmuchreimbursementdoesmassachusettsreceivefromthefederalgovernmentf
ormoneyspentonstatemedicaid'
          => '2', 'whatismostlikelytohappenifmassachusettscutschapter70funding'
          => '2', 'id' => 'QnGAeILX7yMAAAVX5qw', 'personalincometaxiscurrently'
          => '2', 'approximatelyhowmanyfamiliesareonstatewelfare' => '1',
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