

Data Analysis for Game Development

Administrative

IMGD 2905

Outline

- Background
- Admin Stuff
- Motivation
- Objectives

Professor Background (Who am I?)

- Mark Claypool (professor, “Mark”)
 - Professor, Computer Science
 - Director, Interactive Media and Game Development
- Research interests
 - Multimedia performance
 - Congestion control (protocols, AQM)
 - Wireless networking
 - Network games
- Currently playing



Student Background (Who are you?)

1. Year?
2. Major?
 - a. IMGD Art or Tech
 - b. Other
3. Background?
 - a. Statistics
 - b. Probability
4. Tools?
 - a. Python
 - b. Excel
5. Platform of Choice?
 - a. Windows
 - b. Linux
 - c. Mac

Classes



- In-person (yay!)
 - No online options
 - Miss?
 - Slides are available
 - See classmates for notes
- Masks? (poll/survey)
- Lectures, Q&A, Intro to projects
- Group work ...
- Let's be flexible! Let's see this goes, what's going well, what is not and adjust!

Syllabus Stuff

- <http://www.cs.wpi.edu/~imgd2905/d22>
 - Linked from Canvas Web page
- Class: **M, T, Th, F** 10-10:50am
- Office hours (Zoom): **TBA**
 - Zoom or in-person
 - Or by appointment
- Email: claypool@cs.wpi.edu (me)
- Discord server
 - Invite code on Canvas page



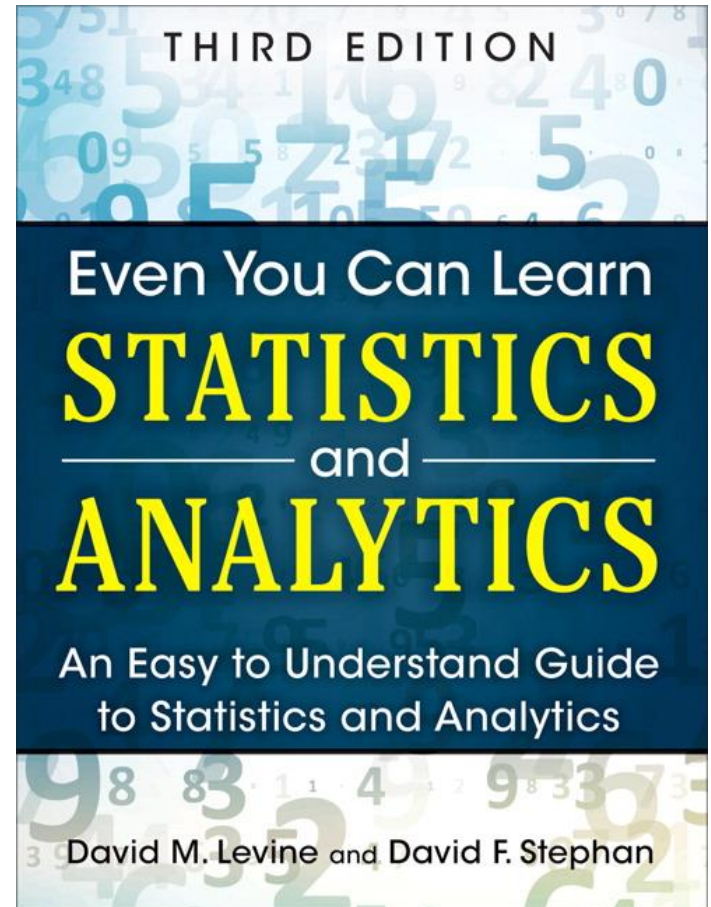
Text Book

D.M. Levine and D.F. Stephan

“Even You Can Learn
Statistics and Analytics”

3rd ed. *Pearson*, 2015

- Unfortunate name, but good content → depth to provide foundation for analytics
- Good examples, but not game-centric



Class Topics

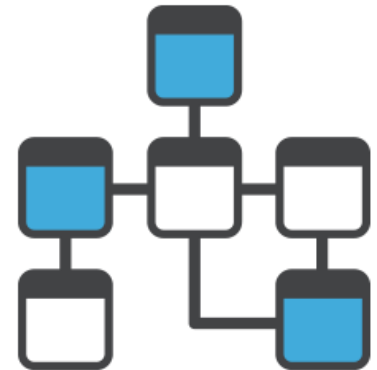
- Data analysis tools and pipeline
 - Statistics
 - Visualizing and presenting data
 - Probability
 - Hypothesis testing
 - Regression
- Apply topics to game data!
 - Commercial and custom
 - New and old

Greedy Pig



Course Structure

- Prerequisites
 - College algebra
 - No {programming, stats, probability} expected
 - No game analytics experience required
- Grading
 - Projects (60%)
 - Homework (30%)
 - Participation (10%)
 - On the Canvas Website:
 - <https://canvas.wpi.edu/courses/33416>
 - Authenticate with WPI login and password



<http://idwbi.com/wp-content/uploads/2017/01/database-Schema.png>

Projects

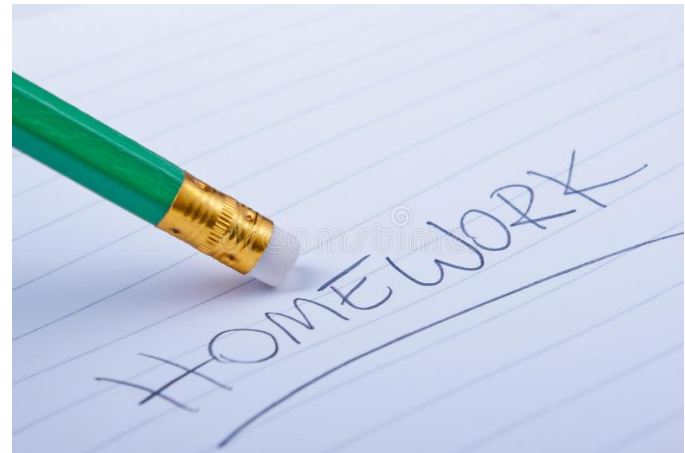


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- 4 projects, 60% of grade total
 - Last project slightly larger
- Do game analysis on actual game data!
- Use game analytics pipeline
 - Typical flow for game (and other) analytics
 - Common tools used for analytics
- Multiple instances of analysis
 - Apply, become skilled with methods of synthesis, interpretation, dissemination
- Project 1 – today!

Homework

- Written problem set
- From the book, Web, made up
- Solve with pencil and paper
- Or calculators
- Or Excel



Participation

- Showing up to class matters
 - Come to class!
- Being engaged in class matters
 - Don't multi-task!
- Ask questions, answer questions
- Weekly “survey” → get your feedback on how the class is going!
- 8% of your grade
 - But much bigger indirect effect!



Playtesting

- Engage with WPI IMGD community
 - Playing and testing each other's games
- Useful for development, research
 - Focus groups
 - Interviews
 - User studies
- Two (10-30 min.) sessions
- 2% of your grade



Slides

- On the class Web page
- PowerPoint and PDF
- Caution! Don't rely upon slides alone! Use them as supplementary material
 - (come to class)

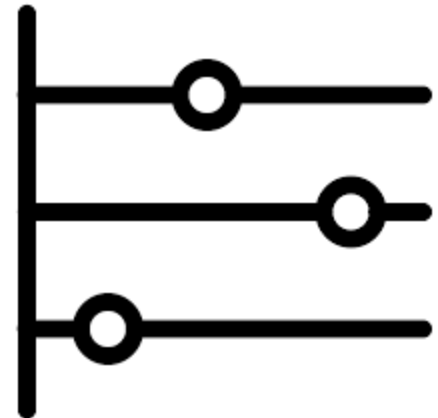


Timeline

- *Tentative* timeline for dates for exams and projects
 - In order to help you plan

<http://www.cs.wpi.edu/~imgd2905/d22/timeline.html>

- Will notify if update



Why This Class?

Why This Class?

Goals

- Gain proficiency using **modern tools** for **data acquisition** and **analysis**
- Understand basic **probability** and **statistics** as it applies to **data analysis**
- Develop skills for **presenting** game data analysis both orally and in written form

Objectives

- Use **spreadsheet** to **analyze** and visualize game data
- Use **scripting language** to extract and clean data recorded from game
- Apply **summary statistics** to game data
- Compute **probability distributions** for game data
- Write **reports** with graphs and tables illustrating **analysis** of game data
- **Present** game dataset report using appropriate visual aids

Why This Class? – Other

- WPI IMGD requirements
 - Gotta take **Math/Quantitative Science**
- **Statistics** and **Probability** useful for game design and development
- **Game Analytics** similar to other forms of analytics (e.g., Data Science)
- **Fun!**
- Game analysis increasingly important (**jobs!**)

Jobs

Game Play Data Analyst, Sony Interactive Entertainment



- **Duties**

- Advise, define implement gameplay data to ensure understanding of player experience
- Provide insights that impact game design and improve quality
- Create and maintain player segmentation that allows understanding of engagement and spending
- Mine data sets and develop dashboard for live service teams, game developers
- Devise and implement A/B experiments to test acquisition, engagement
- Present finding and provide recommendations

- **Requirements**

- BS/BA degree Stats, Math, Econ, CS or related
- Experience with SQL
- Experience with data visualization packages
- Experience with statistical software
- Experience with Amazon cloud services
- Have created and presented visualizations and insights to various business groups
- Passion for video games preferred

Jobs

Analyst, Riot Games



- **Duties**

- Aggregate and analyze petabytes of game data from various sources
- Prep data for deeper analysis and/or reporting
- Organize collected data into reliable intel that informs Rioters to improve player experience
- Work with decision-makers to understand goals, identify opportunities, and inform decisions across company
- Create awesome

- **Requirements**

- BS/BA degree Stats, Math, Econ, CS or related
 - Graduate degree preferred
- Business savvy
- Technically adept
 - SQL, Python
 - Excel, PowerPoint
- Communicator
 - Reports clear, and concise
 - Presentations to variety of audiences