IMGD 1001 - The Game Development Process: Architecture

by
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(with lots of input from Mark Claypool!!)

Outline
- What is architecture
- A few notes
- Let's try it!
Architecture

- "The design of the built environment"
- The part of the code that isn't code
- The shape of the design
  - High level: the overall arrangement of the pieces
  - Low level: the shape and style of the individual pieces

How to Do It

- Write down the user stories
- Identify the key elements
- Create component lists
- Define the class tree
- Iterate over the class tree
  - Work out the details of each element
Let's Work Through One

- We're going to design a game
- We're not doing the game design -- that's already done
- You might have heard of it.
  - It's called "Tetris"

Write Down the User Stories (1 of 5)

- We need a routine to sort a list
- A list of tasks the player is trying to accomplish
- Be as exhaustive as possible
- Ex:
  - Player is interrupted and needs to pause: the game must have a pause key and freeze instantly, with sound muted.
  - Player wants to understand current state at all times: game level, character's health, number of lives, and current score is always on screen
Identify Key Design Elements (2 of 5)

- Write down the key objects in your design
- What are the major pieces?
- Ex:
  - Score area
  - Player’s spaceship
  - Missiles and buttons
  - Enemy objects
  - Particle systems
  - Game boundary areas

Create Component List (3 of 5)

- Identify commonalities among identified game objects
  - Sometimes NPCs and player characters are similar, etc
- Create and name a set of base object types (classes)
  - Spaceship
  - Enemy
  - Bullet
  - Missile
  - Wall
Define the Class Tree (4 of 5)

- It’ll be close to the component list, but may not be identical
- Sometimes game objects don’t map so neatly to classes
  - You might be better off implementing capabilities (“controllable”, “explodable”)

For Each Class in the Tree (5 of 5)

- Define its capabilities
  - Functions / methods
- And the data it has to store
  - Member variables
- If you’re a visual thinker, UML might help
- More on this in CS!
You’re Probably not Done!

- But you’re a lot better prepared
- Keep this documentation up-to-date
  - It helps others who come on board later

Tetris Key Features

- Colored blocks fall from the sky
- They have different shapes
- Players arrange them as they fall to fill up rows
- Completed rows are destroyed
- Player loses when there’s nowhere to put a new piece