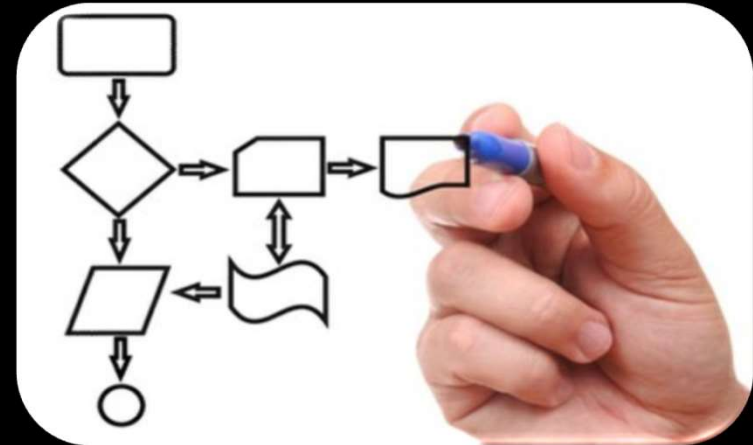# Game Design Document

PMU199 Supplemental Notes

# Hand Eye Society announcement

# Software Engineering



- Based on the idea that computer scientists should create software the way architects create buildings.
  - Understanding of what the software will do.
  - Analysis of the necessary software components.
  - Planning of the development of each component.
  - Coordination of the team and the development.

# The Design Document



- The design document describes all aspects of your game, without actually creating code.
  - Acts as a contract between designer and client.
  - Also acts as a blueprint for future developers.

# Design Document Components

- **Software Design Documents** (SDDs) in the game industry often outline the following:
  - High level summary.
  - Background on project domain (definition of terms, etc).
  - The game requirements, and how to achieve them.
  - Constraints (both technical and non-technical).
  - Development procedures and coding guidelines.
  - Languages and tools that will be used.
  - Definitions of variables and a description of their usage
  - Logical structure and logical processing steps.
  - Error, alarm and warning messages.
  - Performance & reliability.

# Presentation considerations

- Biggest issue from past presentations:

> **Too much telling. Not enough showing.**

- Examples:
  - No level designs, just level descriptions ☹
  - Reading blocks of text off the slides ☺
  - No models or tech demos, just "inspirations" ☹

> **Present the blueprint, not just an advanced pitch.**

# Document considerations

- The #1 item when creating a document:

> **Do not approach any document like a checklist.**

  - The list items on the previous page are a reminder of what you need, not a linear set of instructions to follow.
  - There has to be a sense of flow and cohesion.

- The #2 item when creating a document:

> **Create the document with your reader in mind.**

  - Should answer all questions on how to create the game.

# Design Document Tips

- **Organization is very important.**
  - Break down your game into parts, and create a section for each part in your document.
- **Be both general and specific.**
  - Outline motivations as well as details.
- **A picture is worth a thousand words.**
  - Include diagrams, sketches, screenshots and/or storyboards.
- **Every design document is different.**

# Level Design Exercise

# Breaking down your levels

- **Step #1** (to do alone):
  - Describe the features of an easy level, a hard level, and a medium difficulty level.
- **Step #2** (with somebody from another group):
  - Describe the skills needed to perform your medium difficulty level.
  - *"The player needs to know how to move around the level, how to jump, how to pick up and throw crates, and how to combine these together to open the door by placing the crate on the floor switch."*
- **Step #3** (with the people in your group):
  - Compare the lists of skills that the player needs to do, and order levels based on those skills.

# Example
# Game Design
# Presentation
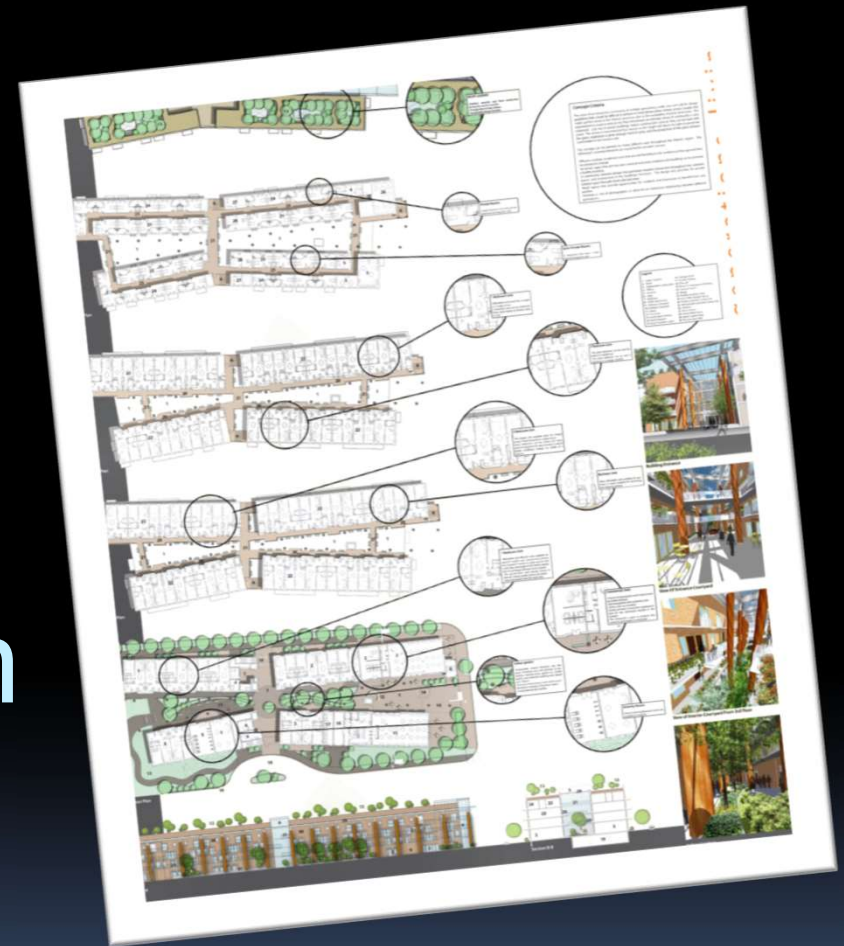
# Rocket Launcher

- Game starts with general game options:
  - Instructions & controls.
- Gameplay is broken down into the following stages:
  - Adjust rocket speed and angle.
  - Perform launch simulation.
  - Player can choose to replay or return to main menu.

Start

Main Menu

Instructions?

Yes

Instructions

No

Adjust settings

Launch

Perform launch

Yes

Replay?

No
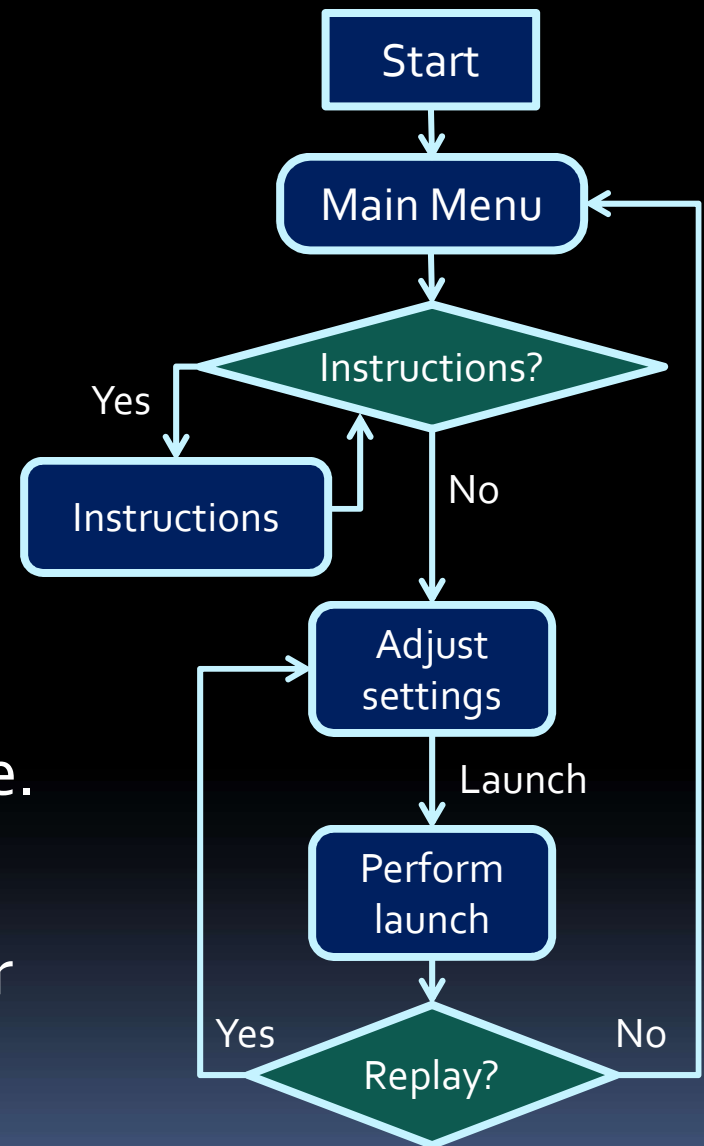
# Level Design

- Each level is made up of a starting planet (Earth), a highlighted target planet, and several intermediate planets.
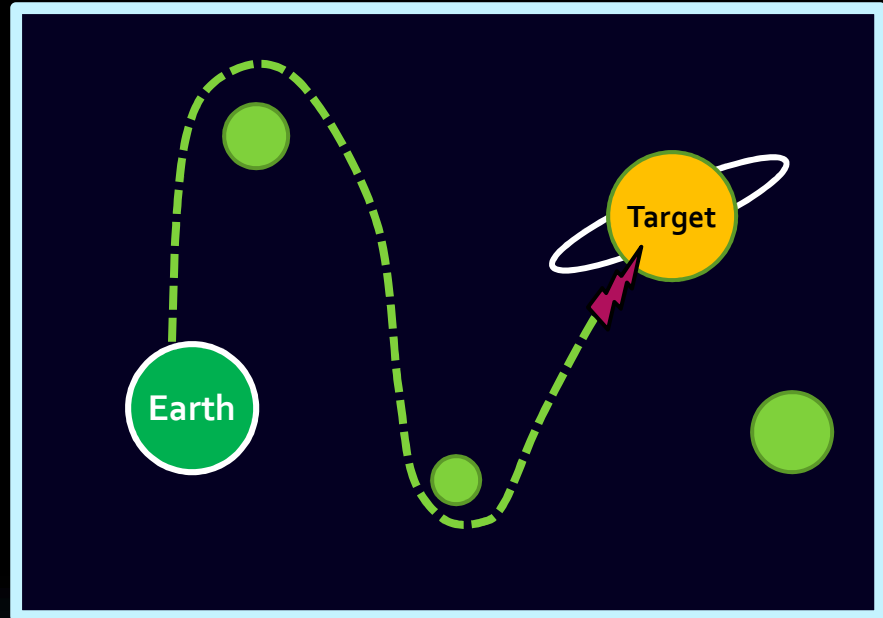


- Players are given a chance to observe the planets' movements before launching.

# Gameplay Outline

- 10 levels total.
- When players click on "Launch", the rocket takes off at the specified angle and speed.



- As the trajectory approaches the planets in the field, the movement is affected by the equation for universal gravitation:

$$F_g = G\,\frac{m_1 m_2}{d^2}$$

# Score breakdown

- Score is awarded as a sum of time and proximity factors:
  - Each 50 ms of travel time adds 1 point to the overall score.
  - Traveling within 1000 km of a planet increases score by 10 for every 50 ms spent close to planet.
- Level is cleared if target planet is reached, and score is over 100 points.
  - Stars are awarded for every 25 points above 100, to a maximum of three stars.