GAME MAKING

Lesson 05

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CONTENT

❖ What is a game?
❖ Game development basics
❖ Game Project Structure

What is a game?

❖ What's the difference between a game, a toy and a simulation?

Simulations

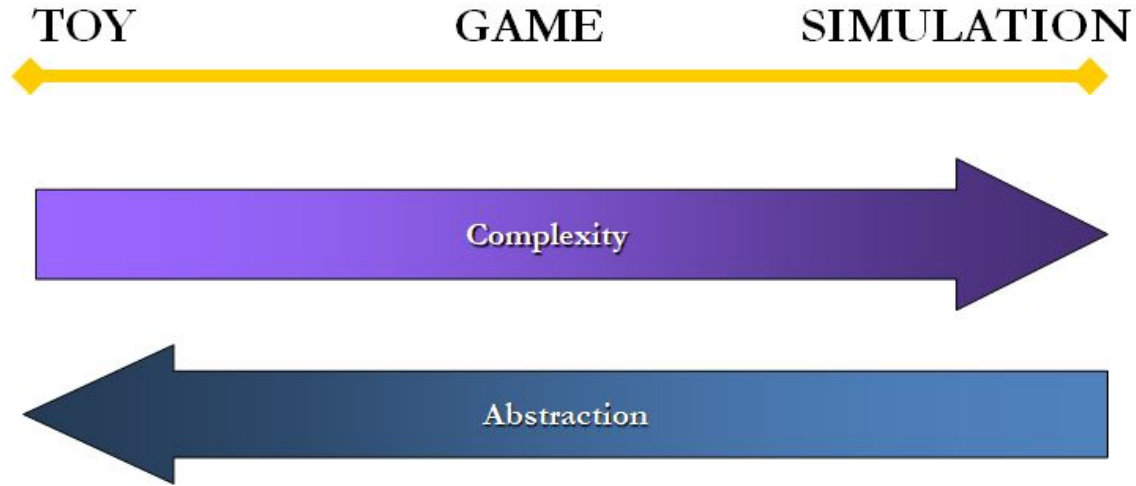**Try to closely mimic reality**
Complexity may affect fun

Toys, Games, and Simulations

TOY   GAME   SIMULATION

Complexity →

← Abstraction

Abstract economic system

- ❖ Players
- ❖ Objectives
- ❖ Actions
- ❖ Rules
- ❖ Resources
- ❖ Boundaries
- ❖ Conflict
- ❖ Outcome

So a game is..

❖ Closed, formal abstract economic system
❖ Players involved in engaging structured conflict to achieve a goal
❖ Resolves to an unequal outcome

Game development basics

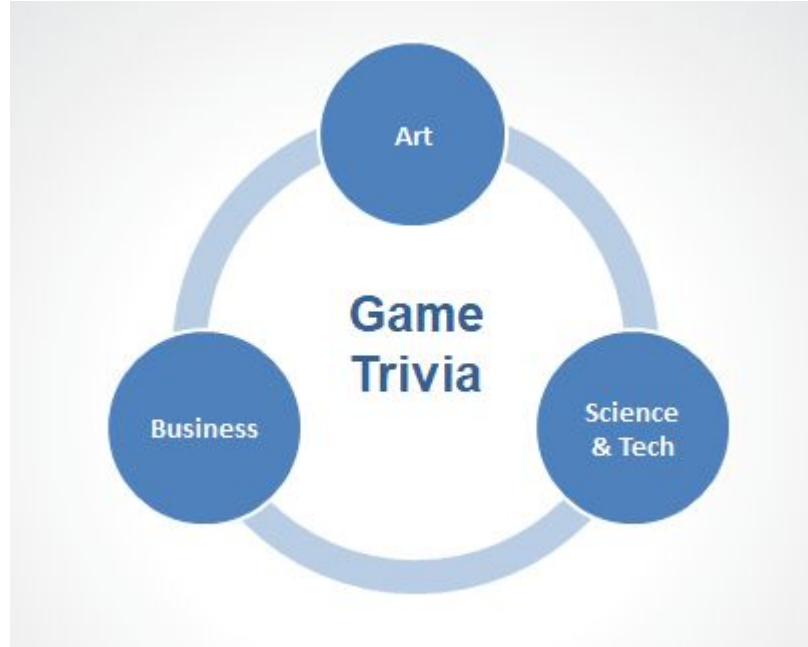❖ What are the differences of a "video game"?

a software

a video game

a movie

The differences are…

- ❖ An interactive medium:
  - ➢ Interactivity that make games differ from movies and other art form.
  - ➢ The content of the game as a Medium that make games differ from other software.
  - ➢ And obviously they are more fun

The Game has got it ALL

Gameplay SFX Scripts Game Engine Shaders

Games are simply complicated

GUI Light Maps Post-processing Voice Over Models Story

Game …

❖ Game has different structure than other software:
  ➢ Start up
  ➢ Introductory Movie
  ➢ Front End
    ■ Game Options
    ■ Sound Options
    ■ Video Options
  ➢ Loading Screen
  ➢ Main Game
    ■ Cinematic
    ■ Gameplay
    ■ Pause Options
  ➢ End Game Movie
  ➢ Credits
  ➢ Shut down

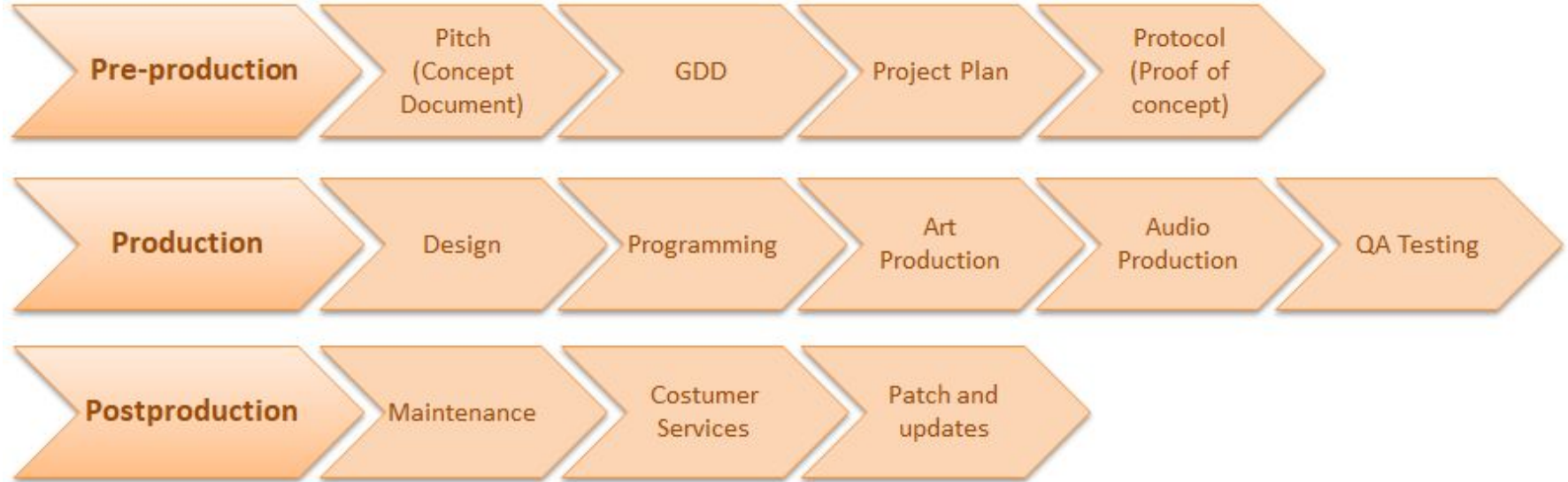# Game loop

```cpp
// a simple game loop in C++
int main()
{
    Initialize();
    while (true)
    {
        Process();
        Update();
        Render();
    }
    ShutDown();
}
```
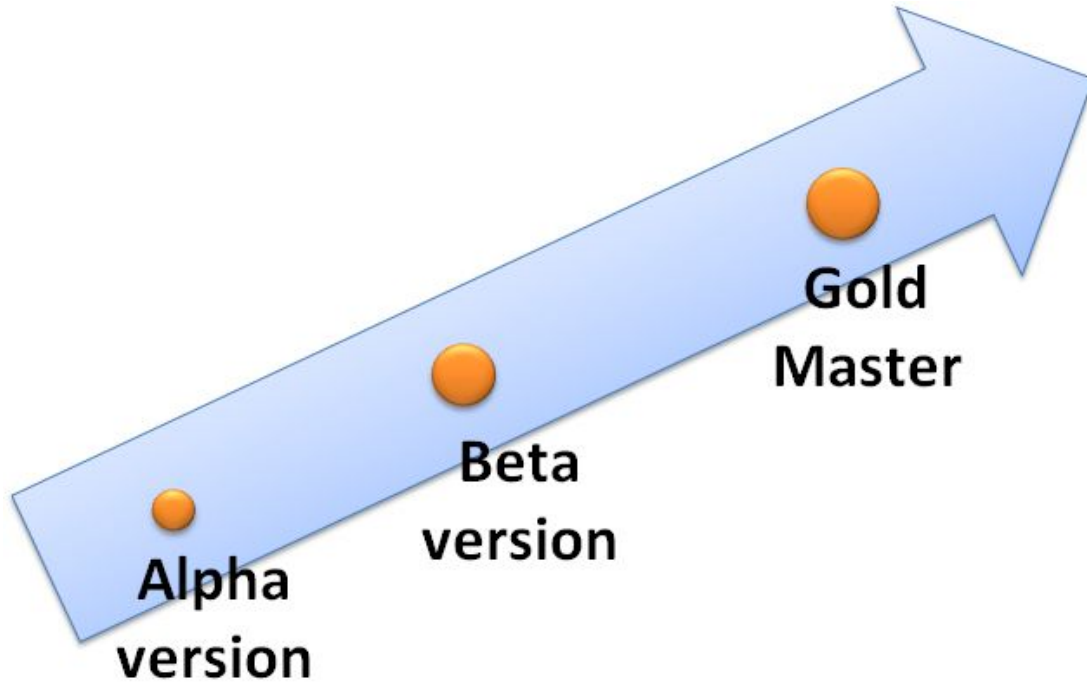
What actually happens?

```
while(true)
{
    /* Process controller input : Checks for
    player's input .. For example , if the player
    hits spacebar then make the character jump … etc
    */
        Process();
    /* Update entities : this is where the game
    reacts to the changes the player's made as well
    as updates the game state */
        Update();
    /* Update Graphics : draw the background, draw
    sprites, update HUD elements, etc */
        Render();
```

Game Development Process

Pre-production	Pitch (Concept Document)	GDD	Project Plan	Protocol (Proof of concept)

Production	Design	Programming	Art Production	Audio Production	QA Testing

Postproduction	Maintenance	Costumer Services	Patch and updates

Three main milestones

Alpha version

Beta version

Gold Master

About game design

- ❖ The Content and Rules of the Game
- ❖ You describe what the game will look and act like
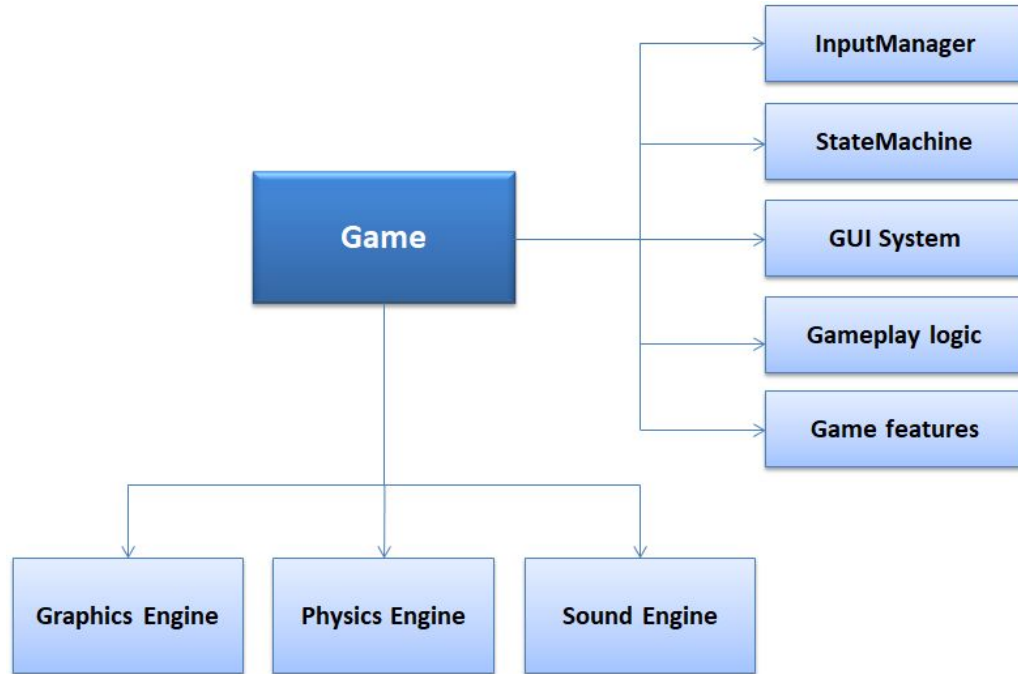- ❖ Game Design is very critical and requires experience and knowledge

About game design

❖ All design information about your game
  ➢ Game Modes
  ➢ Game Structure
  ➢ Gameplay
  ➢ Control
  ➢ Interface
  ➢ Special Features

Game Project Structure

Game engines

- ❖ Graphics engine:
    - ➢ Cocos2d
    - ➢ Unity
    - ➢ Unreal
- ❖ Physics engine:
    - ➢ Bullet
    - ➢ Box2D
    - ➢ Havok
- ❖ Sound engine:
    - ➢ Vox
    - ➢ IrrKlang

Game features

- ❖ In-App-Purchase
- ❖ Social Networks sharing
- ❖ Advertising
- ❖ Leaderboards
- ❖ Achievements

Assignment

❖ Read **Shader, 3D model** and **texture mapping**
❖ Build and run demo
❖ Create a project in github (https://github.com/) and push your code into it
❖ Add more buttons (inherited from Sprite2D) and Objects (inherited from Sprite3D)
❖ Remove raw pointer by smart pointer

Q&A

❖

Reference

❖ https://en.wikipedia.org/wiki/OpenGL_Shading_Language
❖ https://en.wikipedia.org/wiki/3D_modeling
❖ https://en.wikipedia.org/wiki/Texture_mapping
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