

Introduction to Game Programming

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Outline

- Course Introduction
- Evolution of Video Game Programming
- Game Loop
- Python - Pygame

Course Introduction

- Assessment:
 - **80%:** Assignments (6-7)
 - One 3D
 - **20%:** Final Exam (multiple choices + writing test - 75 minutes)
- Reference:
 - [1] Sanjay Madhav, **Game Programming Algorithms and Techniques - A Platform Agnostic Approach**, 2014.
 - [2] Al Sweigart, **Making Games with Python & Pygame**, 2012.
 - [3] Mat Buckland, **Programming Game AI By Example**, 2004.
 - [4] Paul V Craven, **Program Arcade Games With Python and Pygame**, 2014.

Evolution of Video Game Programming

- Atari Era (1977–1985)
 - NES and SNES Era (1985–1995)
 - Playstation / Playstation 2 Era (1995–2005)
 - Xbox 360, PS3, and Wii Era (2005–2013)
 - The Future
-
- **AAA** game???

Game Loop

```
while game is running
    process inputs
    update game world
    generate outputs
loop
```

Examples: 2048, Caro, Chicken Invader

Exercise: Read “Time and Games” – chapter 1 [1]

Game Objects

- What is Game Object?
- Types of Game Objects
 - Draw-only
 - Update-only
 - ?

Python Tutorial

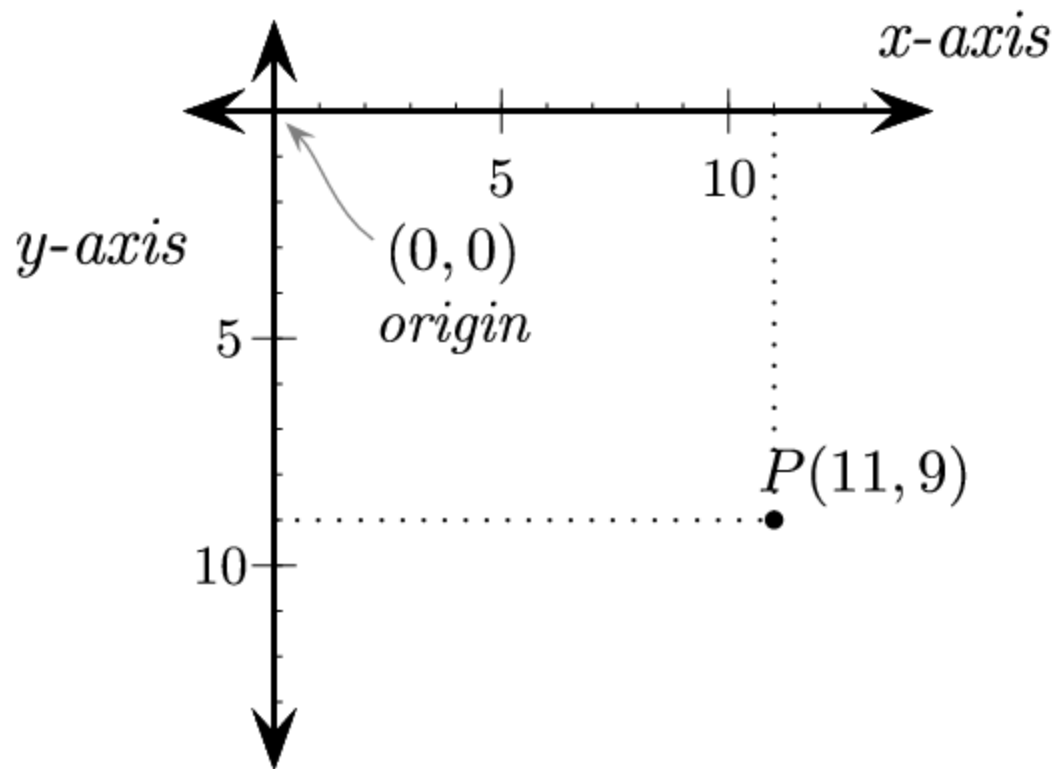
- print
- Data Type
- If statement
- Loop statement
 - For loop
 - While loop
- Function
- List
- Class

Pygame Tutorial

Hello World

```
1. import pygame, sys
2. from pygame.locals import *
3.
4. pygame.init()
5. DISPLAYSURF = pygame.display.set_mode((400, 300))
6. pygame.display.set_caption('Hello World!')
7. while True: # main game loop
8.     for event in pygame.event.get():
9.         if event.type == QUIT:
10.             pygame.quit()
11.             sys.exit()
12.     pygame.display.update()
```


Computer Coordinate Systems



Color (RGB)

Define some colors

BLACK = (0, 0, 0)

WHITE = (255, 255, 255)

GREEN = (0, 255, 0)

RED = (255, 0, 0)

Drawing Introduction

<u>pygame.draw.rect</u>	— draw a rectangle shape
<u>pygame.draw.polygon</u>	— draw a shape with any number of sides
<u>pygame.draw.circle</u>	— draw a circle around a point
<u>pygame.draw.ellipse</u>	— draw a round shape inside a rectangle
<u>pygame.draw.arc</u>	— draw a partial section of an ellipse
<u>pygame.draw.line</u>	— draw a straight line segment
<u>pygame.draw.lines</u>	— draw multiple contiguous line segments
<u>pygame.draw.aaline</u>	— draw fine antialiased lines
<u>pygame.draw.aalines</u>	— draw a connected sequence of antialiased lines

Animation

- Sprite
- Animation

Controllers and Graphics

- Keyboard
- Mouse
- Game Controller