ImpactLab - Game Dev
Lecture 1: Introduction

Summer 2023

School of Computing and Data Science

Wentworth Institute of Technology

Me

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Welcome to the afternoon CS ImpactLab

- Major goals for my afternoon sessions:
  - Use Unity to create full games from scratch
  - Use standard indie game software to create graphics, sound, and music
  - Learn C# (in the Unity way)

We can adjust to whatever you folks want to do!

For Example: Image processing, computational physics, grid-based simulations, cellular automation, etc.

What is my afternoon session about?

This Session is:

About Using a Game Engine: I will teach you the technical aspects of creating games in Unity.

About Expanding your Horizons: Creating games can be fun and frustrating. We'll tackle all the aspects: Programming, Art, Sound, Music, etc.

An Intro to Programming: If you need it, we can go over the intro programming topics.

This Session is Not:

About Design: I will not teach you what makes a good game or how to create a good game.

About Assets: Even though we will create art, sound, music, etc. I can't teach you how to use all the tools.

Tools:

- Overview
  - Unity
  - Visual Studio
  - Git

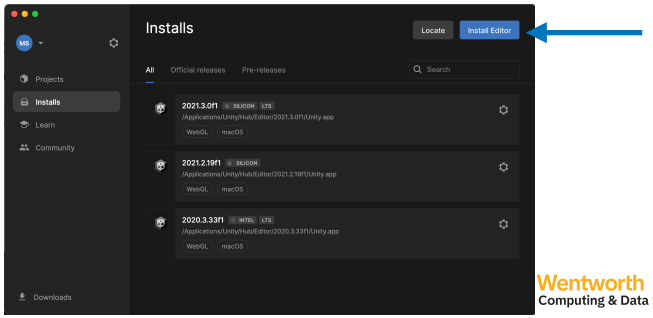
Download and install Unity and get your IDE up and running.

I will be using Unity 2022 LTS for the entire session.

I will use either VS Code or Visual Studio as my editor, but you can use whatever you want.

Unity

- Download Unity Hub:
  - https://unity.com/download
- Create a Unity Account
- Install a version of Unity via the Unity Hub (2022.3)



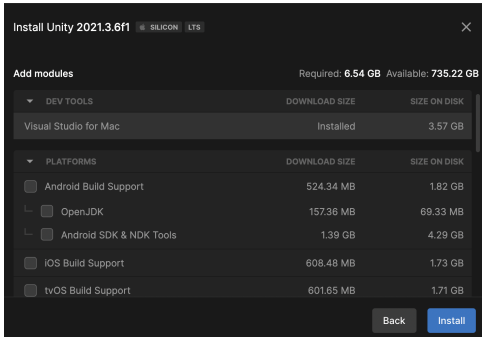
Unity and Visual Studio

- Select Features:
  - You probably want Visual Studio and at least WebGL support.

Visual Studio will be your IDE (to program in).

If you want to use something else, like VSCode, you can.

By selecting different platforms, you can build to different types of computers. For example, WebGL lets to build your games to a webpage.



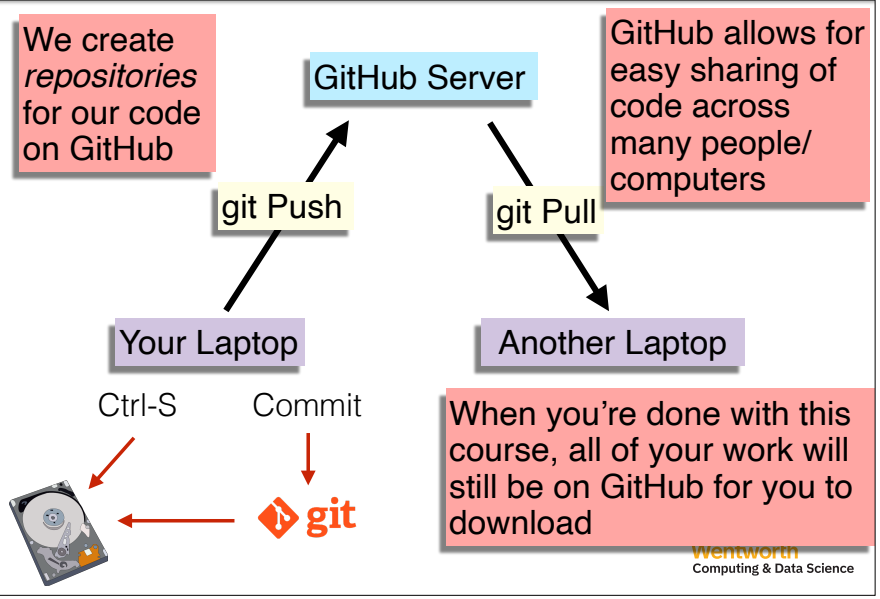
GitHub

- Create a GitHub account (you don't really need one for this session if you don't want to create one):
  - https://github.com
- Download GitHub Desktop (and sign in to the app):
  - https://desktop.github.com/

GitHub Desktop allows for easy access to your GitHub account and makes downloading and saving code a breeze.

If you have another preferred method to interact with git, feel free to use that instead.

Git Crash Course



Secondary Tools

2D Art Tool

- Whatever you want
- Free:
  - GIMP (among others)
- Paid:
  - Photoshop (Industry Standard)
  - Affinity Photo/Designer
  - Pyxel Edit/Aseprite (Popular for Pixel Art)

Secondary Tools

3D Art Tool

- Whatever you want (no 3D art is required for this session, but you can create and use it)
- Free:
  - Blender (Full Polygonal Modeler)
  - MagicaVoxel (3D voxel)
- Paid:
  - Maya (Industry Standard)
  - Modo

Secondary Tools

Sound and Music

- Whatever you want
- Free:
  - Audacity (Audio Recording and Editing)
  - Bosca Ceoil (Easy Music Creator)
  - bfxr (SoundFX Creator)
  - LMMS (Full DAW)

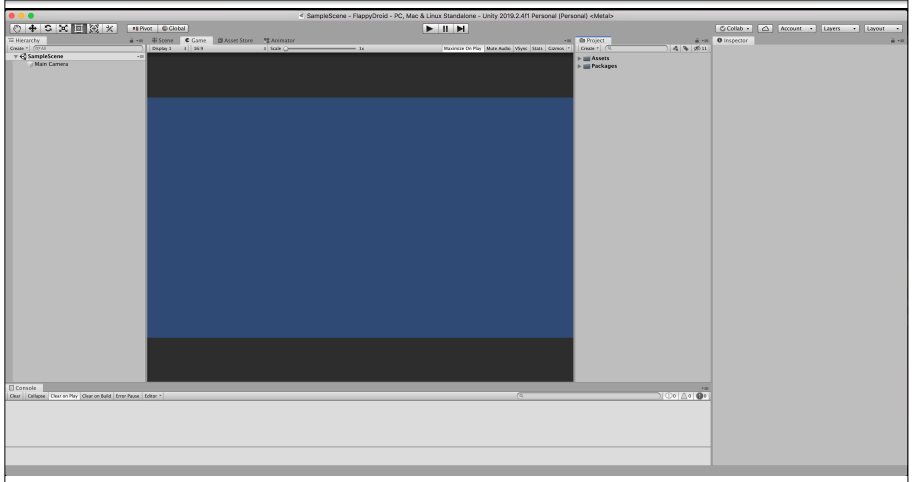
Tools

This is a lot of tools to learn!

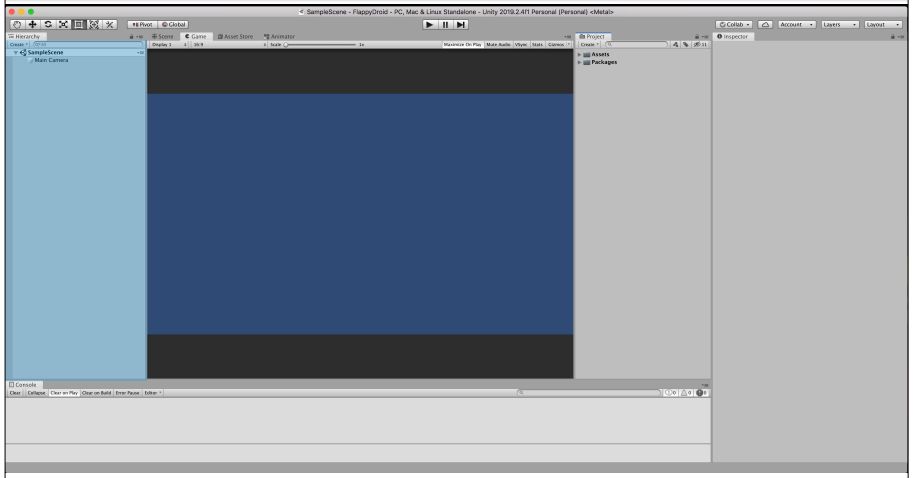
Graphics, music and sound are not as important for this session, but can be fun to make and bring to life in a game.

- My focus will be on Unity.
- I will provide graphics and sound to add to our games, but I'll only talk a little bit about creating them unless you want to see more.
- I can answer some questions about the secondary tools, but I am not an expert in art and sound (as you will soon see).

Unity Interface

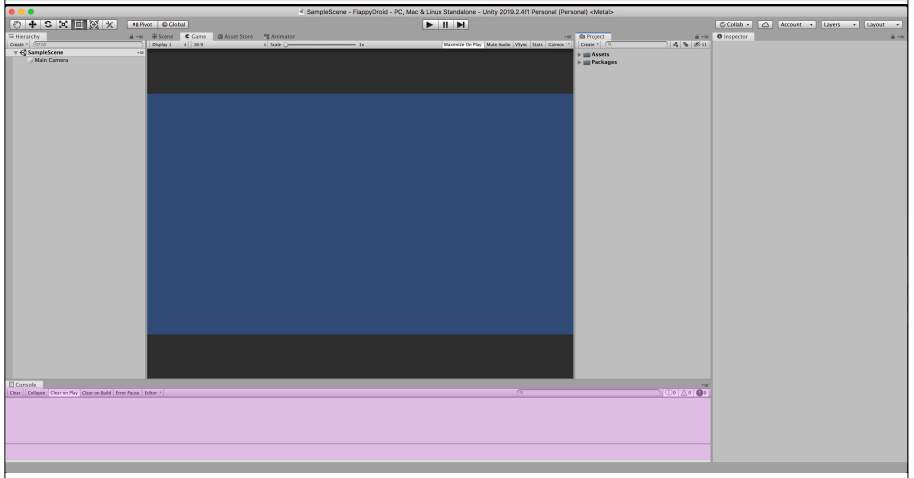


Unity Interface



Hierarchy - displays all objects and scenes within the game

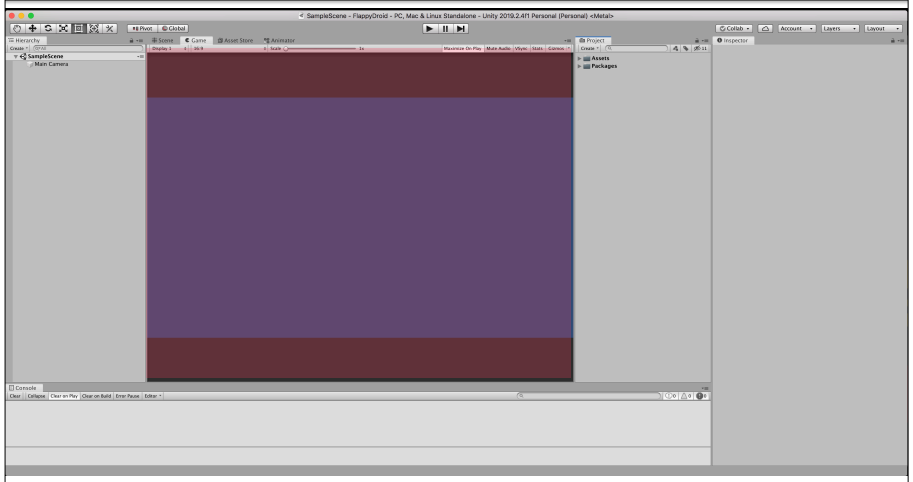
Unity Interface



Console - displays console messages

Other tabs are here as well

Unity Interface



Game Scene - displays the game view

Other tabs show scene for editing

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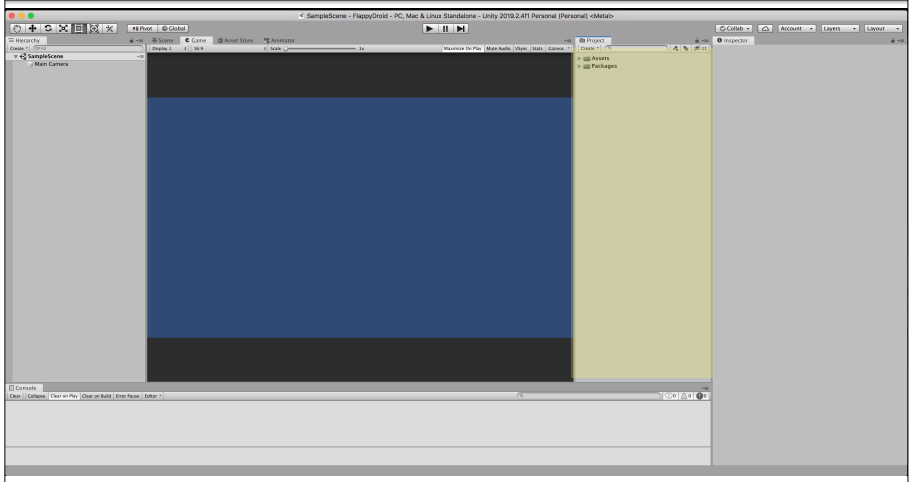
Unity Interface



Project - Displays the files and folders within the current project

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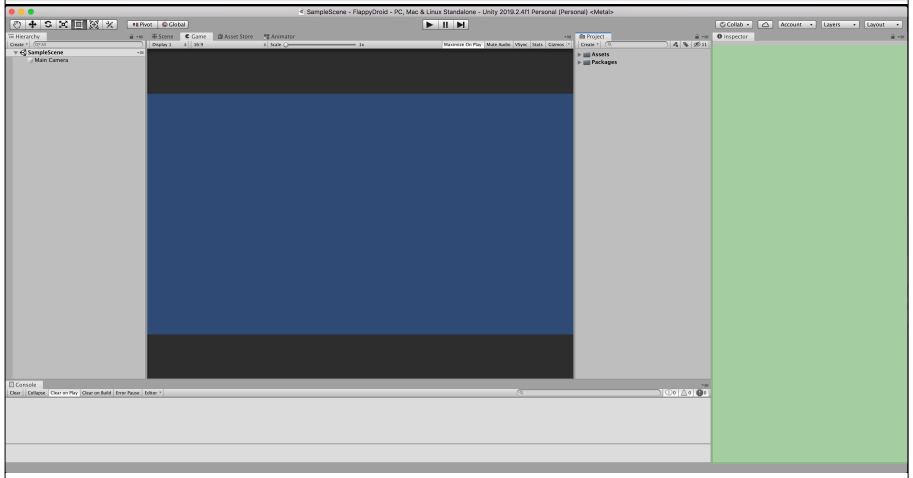

Inspector - displays information about selected objects

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Unity Interface

The entire interface is customizable to your liking

Keep your project clean and organized!

Create folders within the `Assets` folder for scripts, sprites, scenes, sounds, music, etc.

This will help you find elements in your project that you need to edit

For the first game, I will provide you with a (mostly empty) starter project that is organized.

Starting Simple

- Create a `Scripts` folder within the `Assets` folder
  - Right click the `Assets` folder
  - `Create -> Folder`
- Create a new C# Script
  - Right click on the `Scripts` Folder
  - `Create -> C# Script`
  - Name it Hello.cs
  - Double click on the file
- This will open your default code editor

Starting Unity C# Script

```
using System.Collections;
using System.Collections.Generic;
using UnityEngine;

public class Hello : MonoBehaviour
{
    // Start is called before the first frame update
    void Start()
    {

    }

    // Update is called once per frame
    void Update()
    {

    }
}
```

We'll go over C# in more detail if you want. For now, we'll see how this script interacts with Unity.

Starting Unity C# Script

```
using System.Collections;
using System.Collections.Generic;
using UnityEngine;

public class Hello : MonoBehaviour
{
    // Start is called before the first frame update
    void Start()
    {
        Debug.log("Hello");
    }

    // Update is called once per frame
    void Update()
    {

    }
}
```

Save, go back to Unity and click the play button:

Located at the top center of the window.

What happens?

Starting Unity C# Script

```
using System.Collections;
using System.Collections.Generic;
using UnityEngine;

public class Hello : MonoBehaviour
{
    // Start is called before the first frame update
```

Nothing...

The C# script was never attached to an object.

This is a key idea of Unity: Scripts are components of objects

Drag the file directly on to the Main Camera (in the hierarchy)

Now the Script will run the `Start` method when the game starts

Additional Resources

Learning the Interface Tutorial:

http://docs.unity3d.com/Manual/LearningtheInterface.html

Using the Unity Interface:

https://learn.unity.com/tutorial/using-the-unity-interface

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