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CS458: Game Application Development
1st Semester 1445 H

Unity Game Development Guide

After covering the games theoretical and fundamental aspects in class, it is now time to put game design and development into practice using Unity services. Unity provides various helpful services to support developers in creating games. This worksheet will assign you tasks that you should be able to complete on your own. It is designed for self-learning and practice. However, if you have any questions or need clarification about any step, please feel free to ask.

Getting Started:

1. Use the Unity Editor to create 2D and 3D games, apps, and experiences. Download the Editor "Unity Personal – Free version" at unity3d.com.

2. The Unity User Manual helps you learn how to use the Unity Editor and its associated services. You can use it as a reference Unity User Manual 2023.3 (alpha)

3. If it's your first time using Unity, take a look at the introductory documentation on Working with Unity

4. The Unity YouTube channel offers a wealth of video resources demonstrating how to utilize the platform effectively.

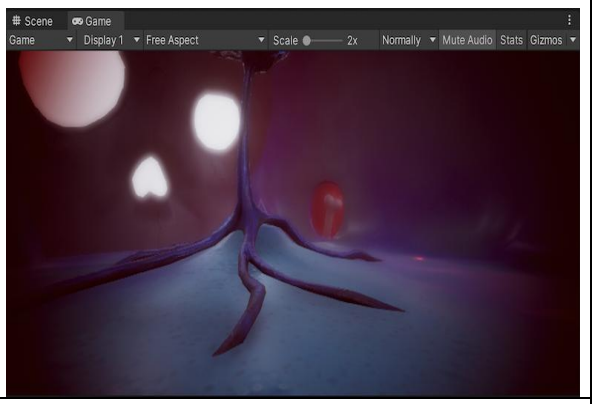
What is Unity?

Unity is a flexible and powerful development platform for creating multiplatform (21 platforms) 3D and 2D games and interactive experiences.

Unity interface and view

The 3D views

The Scene view and the Game view provide windows into your game's world. In the Scene view, you can manipulate game objects and place them in 3D space. The Game view provides a preview of your game.

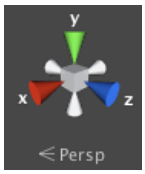
Scene view	Game view
	
https://docs.unity3d.com/2023.3/Documentation/Manual/UsingTheSceneView.html	https://docs.unity3d.com/2023.3/Documentation/Manual/GameView.html

Toolbar

The Toolbar provides access to the most essential working features. On the left it contains the basic tools for manipulating the scene view and the objects within it. In the centre are the play, pause and step controls. The buttons to the right give you access to your Unity Cloud Services and your Unity Account, followed by a layer visibility menu, and finally the editor layout menu (which provides some alternate layouts for the editor windows, and allows you to save your own custom layouts).

	Transform Tools: Navigate scene view+ manipulate objects visually
	Transform Gizmo Toggles – affects scene view display
	Play/Pause/Step-used with game view
	Controls which objects are displayed in Scene View
	Controls arrangement of all Views
	Move: Click-drag to drag the camera around.
	Orbit: Hold Alt and click-drag to orbit the camera around the current pivot point.
	Zoom: Hold Alt and right click-drag to zoom the Scene View.

Scene Gizmo



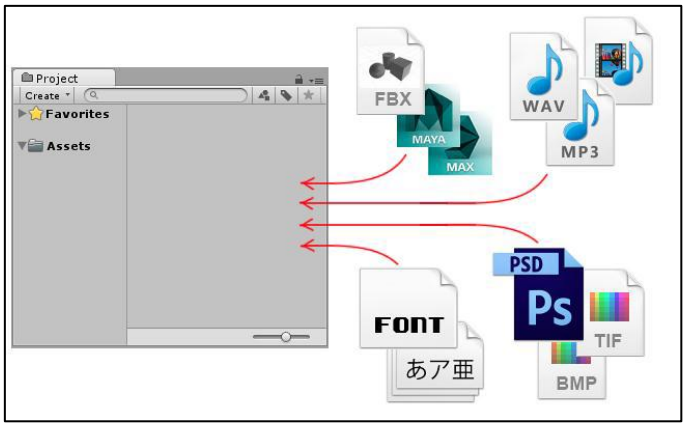
This displays the Scene View Camera's current orientation, and allows you to quickly modify the viewing angle and projection mode.

Assets and Game Objects

There are several windows in Unity that can help you manage game assets in your project and game objects in your scene. They are the Hierarchy, the Project panel, the Inspector, and the Asset Store.

What is an Asset?

An asset is representation of any item that can be used in your game or project. An asset may come from a file created outside of Unity or within Unity.

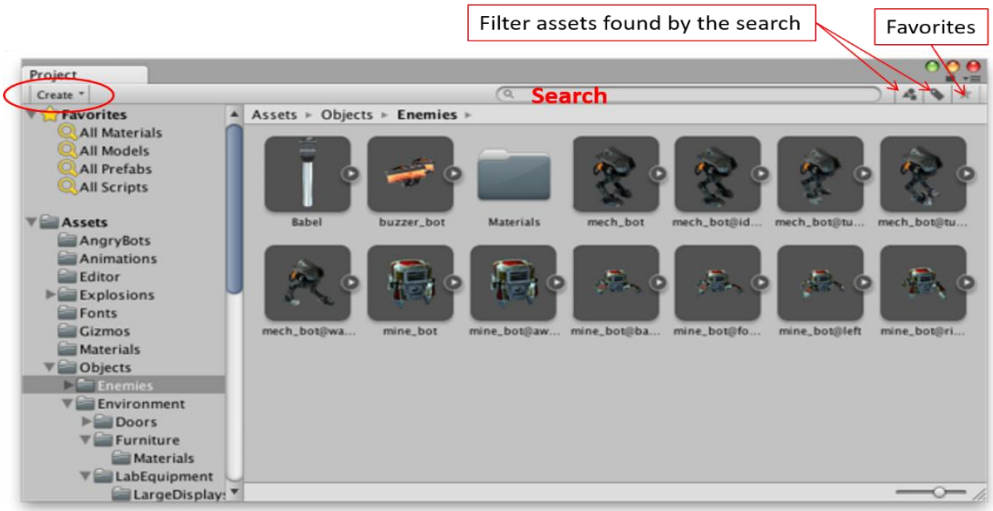


You can learn more about "Importing Assets" of different types on Unity.com.

Project Browser

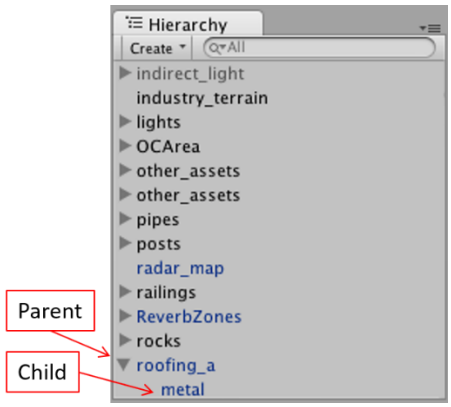
In this view, you can access and manage the assets that belong to your project.

Hold down Alt while you click to expand or collapse any nested folders recursively. Located at the left side of the toolbar, the Create menu lets you add new assets and sub-folders to the current folder.



Hierarchy

The Hierarchy Window is a hierarchical text representation of every object in the scene.



As objects are added and removed in the scene, they will appear and disappear from the Hierarchy as well.

Parenting: By dragging the desired child onto the desired parent, a child inherits the movement and rotation of its parent.

Inspector

Properties and information of currently selected GameObjects and components

The Inspector Window alows you to view and edit all the properties of the currently selected object. Because different types of objects have different sets of properties, the layout and contents of the inspector window will vary.

Remember that you can always use the Inspector to see which Components are attached to the selected GameObject. As Components are added and removed, the Inspector will always show you which ones are currently attached. You will use the Inspector to change all the properties of any Component (including scripts).

The Asset Store

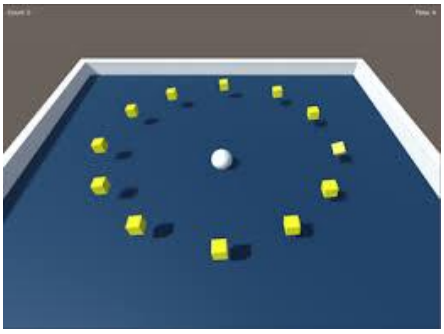
The Unity Asset Store contains a wide variety of assets, covering everything from textures, models and animations to whole project examples, tutorials and Editor extensions. The assets are accessed from a simple interface built into the Unity Editor and are downloaded and imported directly into your project.

You can open the Asset Store window by selecting Window->AssetStore from the main menu.

You can import assets to the asset store & publish assets to the asset store

Roll-a-Ball Tutorial

Simple game where a player will control a ball rolling around the game board using the keyboard and collect the cube game objects. A step-by-step tutorial for the Roll-a-ball learning project is available online on the Unity website: https://learn.unity.com/project/roll-a-ball?uv=2022.3



You should be able to see how to create new game objects, add components to these game objects, set the values on their properties and positions these game objects in the scene to create a game.

- Go to unity3d.com
- Go to learn > tutorials > Roll-A-Ball tutorial
- Do the following parts:
  - Environment and Player
    1. Introduction to Roll-a-Ball.
    2. Setting up the Game.
    3. Moving the Player.
  - Camera and Play Area
    1. Moving the Camera.
    2. Setting up the Play Area.
  - Collecting, Scoring and Building the Game
    1. Creating Collectable Objects.
    2. Collecting the Pick Up Objects.
    3. Displaying the Score and Text.
    4. Building the Game.