EXPERIMENT NO. 3

Aim: Develop a scene in Unity: Create game objects a cube, plane and sphere, Apply transformations to these game objects

Theory:

There are multiple windows in Unity where we perform various operations:

- Project
- Scene
- Game
- Hierarchy
- Inspector
- Other windows

The Project Window

- In this view, you can access and manage the assets that belong to your project.
- The left panel of the browser shows the folder structure of the project as a hierarchical list. When a folder is selected from the list by clicking, its contents will be shown in the panel to the right.
- The individual assets are shown in the right-hand panel as icons that indicate their type (script, material, sub-folder, etc). The icons can be resized using the slider at the bottom of the panel; they will be replaced by a hierarchical list view if the slider is moved to the extreme left.
- The space to the left of the slider shows the currently selected item, including a full path to the item if a search is being performed.

The Scene view

- The Scene view is your interactive view into the world you are creating.
- You will use the Scene view to select and position scenery, characters, cameras, lights, and all other types of Gameobject.
- Being able to Select, manipulate and modify objects in the Scene view are some of the first skills you must learn to begin working in Unity.

The Game view

- The Game View is rendered from the Camera(s) in your game.
- It is representative of your final, published game.
- You will need to use one or more Cameras to control what the player actually sees when they are playing your game.
- You can Play, Pause, Skip to next frame from the buttons in Toolbar & view the output in the Game view.

The Hierarchy window

- The Hierarchy window consists a List of every Gameobject in the current Scene. 1. Some of these are direct instances of Asset files (like 3D models), and others are instances of Prefabs, which are custom GameObjects that make up most of your game.
- When you add or remove GameObjects the Scene (or when your gameplay mechanic adds and removes them), they appear and disappear from the Hierarchy as well.
- By default, the Hierarchy window lists GameObjects by order of creating, with the most recently created GameObjects at the the bottom.
- You can re-order the GameObjects by dragging them up or down, or by making them "child" or "parent" GameObjects.

The Inspector window

- Projects in the Unity Editor are made up of multiple GameObjects that contain scripts, sounds, Meshes, and other graphical elements such as Lights.
- The Inspector window (sometimes referred to as "the Inspector") displays detailed information about the currently selected GameObject, including all attached components & their properties, and allows you to modify the functionality of GameObjects in your Scene

- When you select a GameObject in either the Hierarchy or Scene view the Inspector shows the properties of all components and Materials of that GameObject. Use the Inspector to edit the settings of these components and Materials.

Problem Statement:

Develop a scene in Unity that includes:

1) A cube, plane & sphere, apply transformations on the 3 GameObjects

2) Add a video & audio source

Asset Folder Management:

- All assets need to be categorized & placed in the appropriate folders for us to be able to find them later quickly.
- Eg: Scene files need to be placed in a folder titled "Scenes".
- We can do this in the Project window.

Scene Creation:

- In the root "Assets" folder, on the right hand side, right click & select Create -> Folder.
- Name the folder "Experiment 3".
- Again create a folder name "Scenes" inside it.
- Inside the "Scenes" folder, right click & select Create -> Scene.
- Name the scene "Exp 3".
- Double click on the scene asset created to open it.

Creating GameObjects:

1. Notice that when you create a new Scene, it only has 2 GameObjects in it by default viz- Main Camera & Directional Light. (Check the Hierarchy window)

2. Now in the hierarchy window, right click & select 3D Object -> Plane.

Transform Component:

- Check inspector window after clicking a gameobject in the hierarchy window to view it's components.

- Notice that each GameObject always has a Transform component on it.
- It is responsible for the Position, Rotation & Scale of that GameObject in the game world.
- Select the plane & set the transform component's position & rotation & scaling values acc to:

Change transform values from Scene view:

- There are 3 Gizmos using which we can change aGameObject's values from the scene view.
- Position- The arrows gizmo can be used to change the position in the 3 Axes.
- Select the drag icon from the mini toolbar on the left side of the scene view. Shortcut key- W
- Rotation- Select the rotate icon to rotate the gameobject. Shortcut key- E
- Scale- Select the scale icon to scale. Shortcut key - R

Adding Other GameObjects:

- Create a cube & a sphere in a similar manner & apply the following transform values to it.
- Cube. Position- (0, 0.5, 2)
- Sphere. Position - (-2.5, 0.5, 0.75)
- For an audio video source we will create a Screen with a Quad gameobject.
- Create a Quad gameobject in a similar manner. (right click-> 3D Object -> Quad)
- Set Quad Transform Values- Position- (0, 4.5, 7.75), Scale- (8, 8, 8)

Audio Video Source:

- To make the Quad play a video & have an audio playing capability we will need to add appropriate components to it from the Inspector window.
- Components are the functional pieces of every GameObject. Components contain properties which you can edit to define the behavior of a GameObject.
- To add a component to the Quad gameobject, select it from the Hierarchy & in the inspector window click on the add component button at the bottom.

- Search for Video Player & Audio Source & click on them to add them one by one.

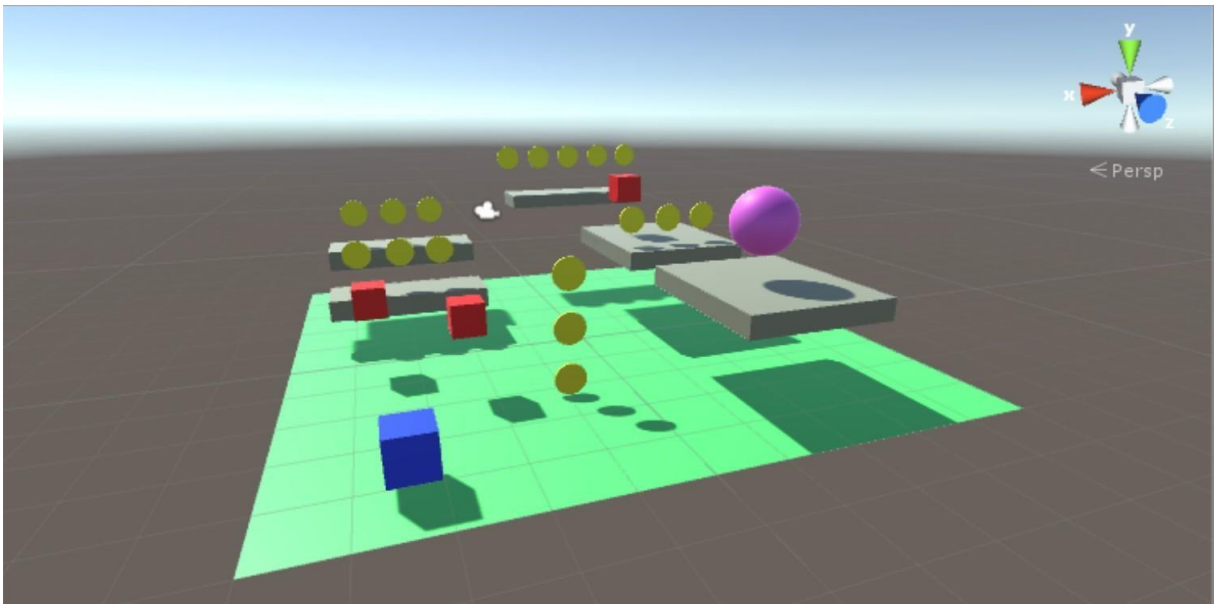
Audio Video Source:

- In the project window, create a folder named "Videos" under the experiment 3 folder.
- Drag & drop a video file from outside Unity to that folder to add it to the project.
- Now assign that video clip from the project window to the Video clip field of the Video Player component by dragging & dropping it to that field.
- Alternatively you could do this by clicking the circle besides the field & then searching for the asset by its name in the pop up window & then selecting it.
- Set up the video player component in the following manner.

Play the Scene

- Click on Play button & watch the whole scene play in the Game window.
- Press Play again to come out of Play Mode.
- Save the scene by Ctrl + S.
- You can only save when out of Play mode.

Output:



Conclusion:

What are the various views available?

Answer->

1) 2D View: Common in design tools, it offers a flat, two-dimensional perspective (e.g., top-down, side, or front view). Used in graphic and web design, blueprints, and architectural layouts.

2) 3D View: A three-dimensional perspective, often used in gaming, VR, 3D modeling, and simulations, allowing users to interact with objects in a spatial context.

3) List View: In UI design, this displays information in a vertical or horizontal list format, used in apps for browsing items, emails, or files.

4) Grid View: Displays items in a structured grid format, useful for galleries, product displays, or dashboards.

5) Split View: Divides the screen into two or more sections, enabling users to view and interact with different content simultaneously, common in file managers or multitasking apps.

6) Tree View: Displays hierarchical data in a tree-like structure, often used in file explorers or for managing large datasets.

7) Map View: A geographical view, often used in navigation apps or location-based services, displaying maps with relevant data.