Week 14 GWC

Getting Started with Game Development in Unity

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Women In Tech Shout-Out of the Week: Manal al-Sharif

- Computer Scientist
- First woman to work as IT security specialist at Saudi Armco
  - Big deal because women in Saudi Arabia have limited rights
- Founder of Women2Hack Academy
  - Helps women in Saudi Arabia become computer scientists
- Social activist
  - Went to jail for 9 days for driving a car

Warm-up

- Print on screen the output of adding, subtracting, multiplying and dividing of two numbers which will be entered by the user.
  - Ex: inputs are 25 and 4

    25 + 4 = 29
    25 - 4 = 21
    25 * 4 = 100
    25 / 4 = 6
  - Notice that 25 / 4 is 6 → why is that?

Game Objects and Assets

- **Game Objects:** all shapes, models, lights, cameras, particle systems
  - The container of a game object holds the various components that make the object
- **Assets:** an asset is any item that exists as a file in the assets folder. All textures, meshes, sound, files, scripts and so on are considered assets
- An asset is something you created that you load into the program and a GameObject is a base class for all entities within scenes (can apply code to them)
- **Built-In Game Objects:** not every game starts as an empty object. There are many built in game objects available to use
  - You can see them by clicking the GameObject menu item at the top of the unity editor or you can download them from the asset store

The Unity Game Editor

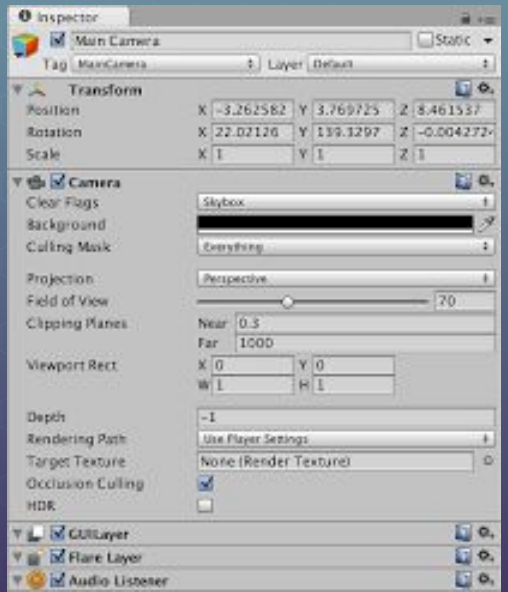
- **Hierarchy View:** shows a list of every game object in the current scene and not the entire project
- **Inspector View:** enables you to see all the properties of a currently selected item. If you click on any asset or object from the project view (or scene view) the inspector will show you all the info about the object or asset
- **Project View:** this tab shows everything that has been created for your project (files, scripts, textures, models, and so on)
- **Scene View:** the most important view -- this enables you to see your game as you build it
    - Using a mouse or hotkeys you can move around inside your scene and place objects where you want them

Hierarchy View

- **Hierarchy View:** shows a list of every game object in the current scene and not the entire project
- When you add or remove game objects from the scene they appear and disappear from the hierarchy tab as well
- By default this window lists all game objects in the order of their creation

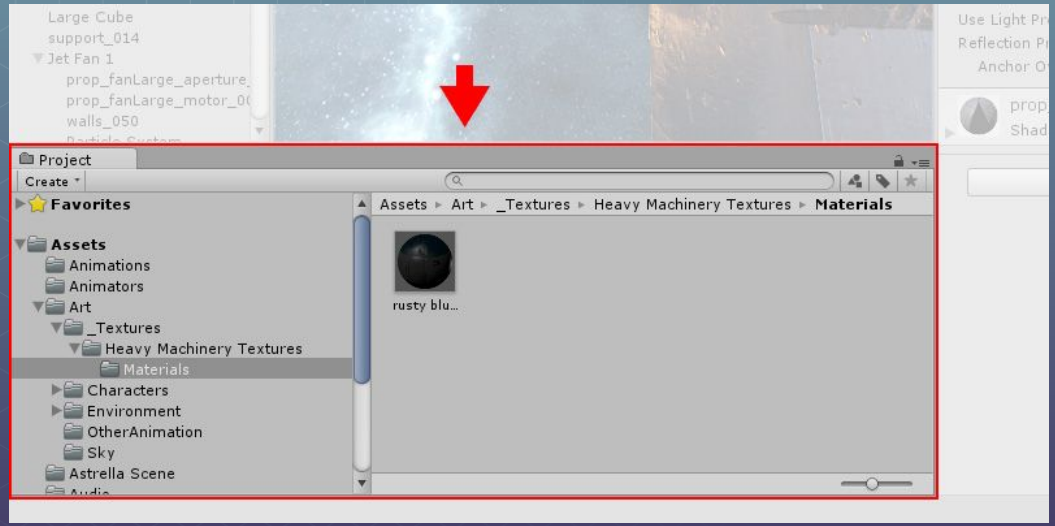
Inspector View

- **Inspector View:** enables you to see all the properties of a currently selected item. If you click on any asset or object from the project view (or scene view) the inspector will show you all the info about the object or asset



Project View

- **Project View:** this tab shows everything that has been created for your project (files, scripts, textures, models, and so on)



Scene View

- **Scene View:** the most important view -- this enables you to see your game as you build it
  - Using a mouse or hotkeys you can move around inside your scene and place objects where you want them

How to Navigate in Scene View

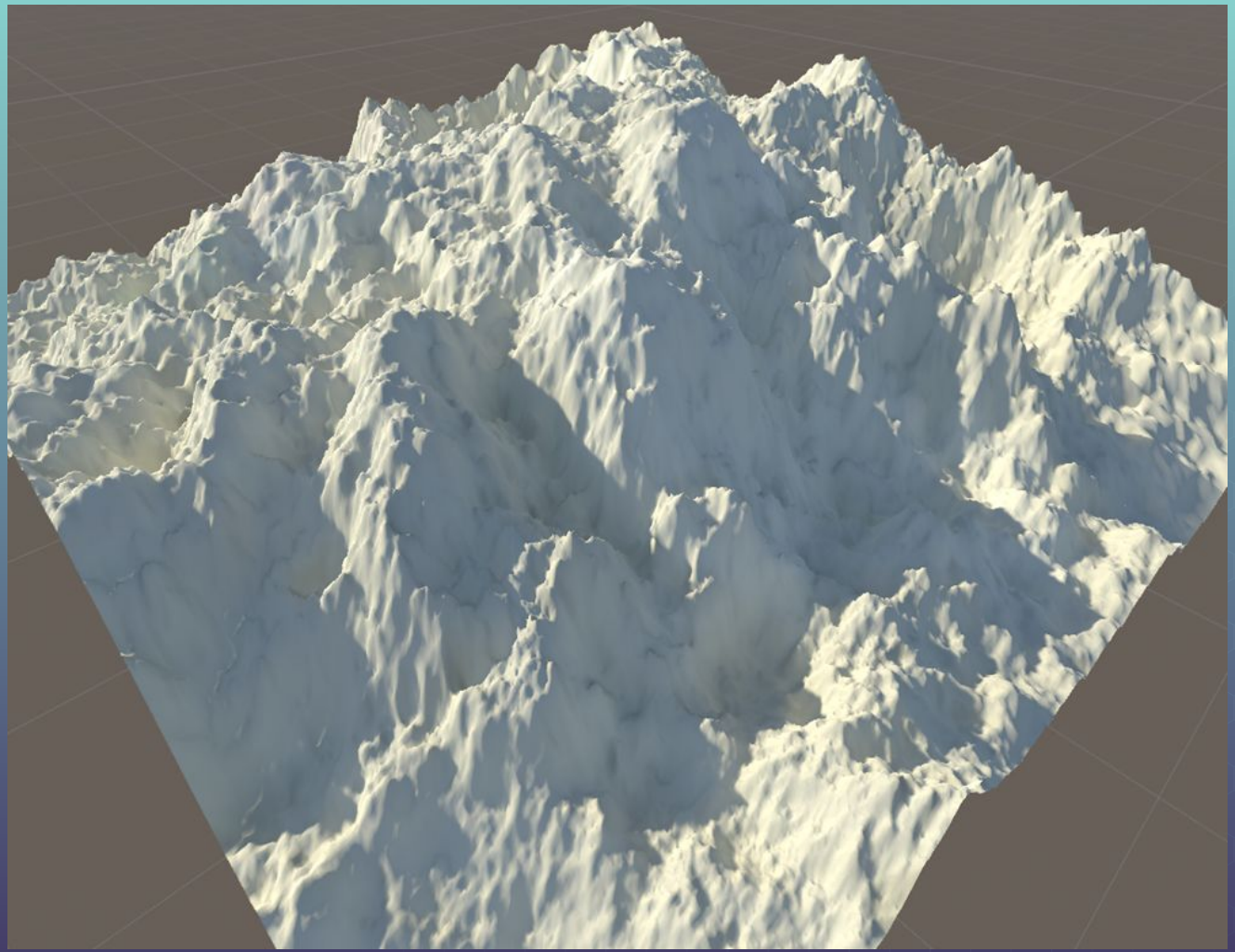
- **Zoom:** is controlled by the mouse wheel -- if you hold alt while scrolling you can zoom in and out of wherever the mouse is currently pointing
- **Hand Tool:** provides a simple way to move around the scene view with the mouse (hotkey Q)
  - Click and drag: moves the camera around the scene
  - Alt + click and drag: orbits the camera around the current pivot point
  - Ctrl + right click drag: zooms the camera
  - https://docs.unity3d.com/2017.3/Documentation/Manual/UnityHotkeys.htm

Testing your games

- Test your games using the Scene View
- **Flythrough Mode:** enables you to move through a scene using a traditional first-person control scheme.
  - **Move the mouse:** causes the camera to pivot, which gives the feeling of looking around the scene
  - **WASD:** moves you around the scene
  - **QE:** moves up and down in the scene
  - **Hold shift while using WASD or QE:** has the same effect as WASD or QE but you sprint
  - **Snap Controls:** to get to an object really fast select it in the hierarchy and then press (shift + f)F (frame select) or double click the object in hierarchy mode

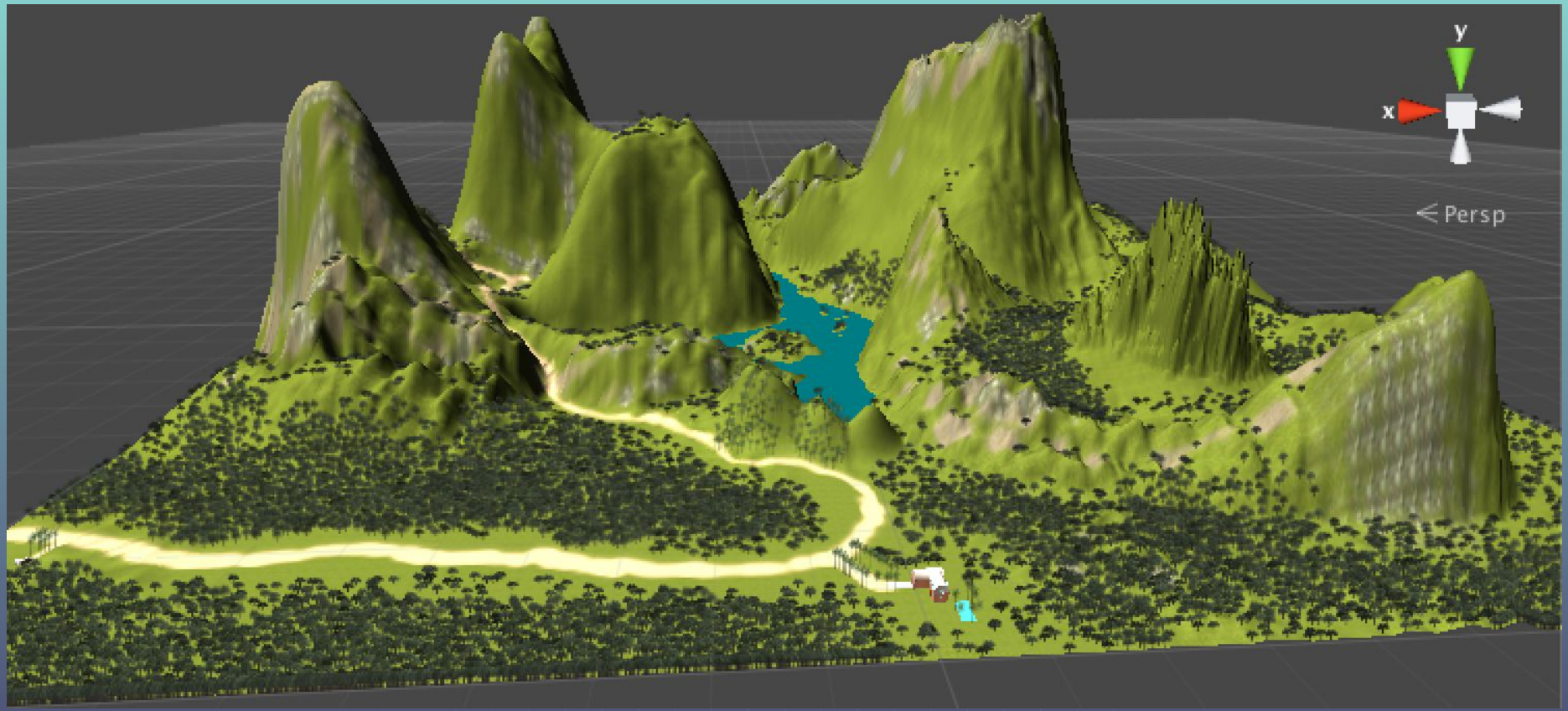
Terrain

- Terrain: any section of land that simulates a world's external landscape.
  - Think Open world game explorable terrain
  - In unity this is a flat mesh that can be sculpted into many different shapes
    - Can't make caves or overhangs these have to be modeled separately
  - Terrain has position rotation and scale but these aren't used during gameplay



Heightmap: a grayscale image that contains elevation information similar to a topographical map

Darker shades can be low points and lighter shades as high points



Terrain Map

Editing Terrain

- Use a brush with a given size and opacity to “paint” terrain on a heightmap
  - The more you paint in one area the stronger the effect will be in that area
- **Raise / Lower tool**
  - Enables you to raise or lower the terrain wherever you paint
    - Click and drag to **raise**
    - Hold shift while click and drag **lowers**
- **Paint Tool** works almost the same as raise/lower tool but it paints your terrain to a specified height
  - **If at any point you want the terrain to go back to being flat go to paint height tool and click flatten - can also flatten to a specific height**
- **Smooth Height Tool** helps remove jagged lines that appear when sculpting terrain

3D Racing Game Walk Through

- Things We Will go Over:
  - The Editor Itself
  - Terrain Building
  - Game Assets
  - Lighting
  - Basic of Textures and Meshes