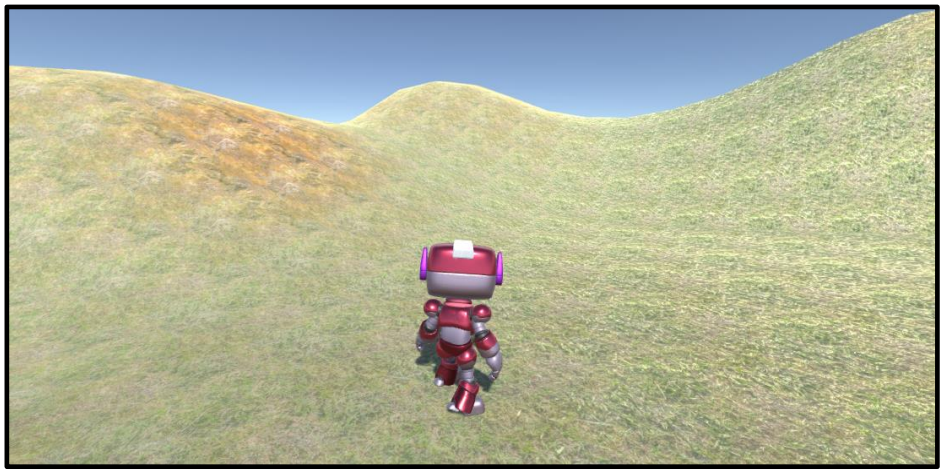
GAME 351
Assignment 1
Manipulating Game Objects and Terrains
Due Sunday, Mar. 24 (11:59:59)

Instructions: In this assignment, you will create your first 3D game scene. This assignment should be done in **groups of 3 or 4.** To receive full credit, your assignment must implement the requirements outlined below. Please submit your project files, along with readme, using D2L's turn-in feature. Your **full, unbuilt Unity project folder** should be packed into a **zip file** (.zip). Include all project subdirectories. Do **not** submit a "built" executable. There should be two files in your submission: A Zip file and a Readme.

Game Assets: You may use or modify the sample project and assets that have been provided to you. You may (should) also download and import individual game assets from the Unity Asset Store to fill out your scene. Please **avoid** extremely large assets and document the assets that you used in your readme. Assume 1 unit = 1 meter in the game world (as is standard for Unity). **No scripting** is required in this assignment, but you may add or modify scripts at your discretion.



To help you implement this assignment, please see the lecture notes and Chapters 3-4 in your textbook. Also, the following tutorials may be helpful:

- A tutorial on painting terrains: https://learn.unity.com/tutorial/texturize-terrains-with-materials#
- A tutorial on using ProBuilder: http://www.procore3d.com/pb-house-tutorial/

Theme of Scenario: Imagine that you're working for an indie game studio and you've been tasked with prototyping a game level for an upcoming fantasy adventure game. In this game, an android named Jammo, member of an advanced robotic species, has crash landed on Planet 949, which is inhabited by a primitive humanoid species. The humanoid species has a roughly "medieval" culture and level of technology (by Earth standards). Please develop **one** game scene which includes the following features:

REQUIRED FEATURES (Complete All 4). Your scene must implement all features listed in this section. Each feature in this section is worth **16%** of the assignment grade.

1. **Follow Camera:** Setup the camera so that it follows Jammo around as the character moves. The camera should be setup in a 3rd person perspective, so that it is looking over Jammo's back, roughly as shown in the screenshot above. The player may control Jammo by using the WASD and/or arrow keys. The 'A' and 'D' (or left and right arrow) keys should be used to rotate the character to left and right, respectively. The camera's orientation relative to Jammo should **not** change as he moves or rotates. Hint: No scripting is required to perform this setup and no additional assets are needed – you have everything you need!
2. **Realistic Terrain**: In the terrain Inspector, use the "**Paint Terrain**" functions to change the height map, creating a realistic relief with hills, mountains, and plains. Your terrain should have positive (hills and mountains) and negative relief (holes or dips that one could fall into). Include a ring of mountain ranges around the periphery, so that the player cannot see off the edge of the map (into nothingness). Populate the interior with rolling hills, and but also include some flatter areas for implementing the other parts of the assignment (below). Use "**Paint Texture**" to paint interesting materials (terrain layers) onto the terrain to simulate dirt, rock, green moss, short grass, etc. Don't leave any part of your terrain bare. Also, give your environment at least two dirt roads or paths. Note: You may use the "Paint Details" functions, with appropriate assets (e.g. grass textures), to give your terrain more detail and realism, but this is not required for full credit.
3. **Trees & Foliage**: Create at least 5 tree **Prefabs** and place them into your scene. Search the Unity asset store for (free) tree assets. Try use a variety of trees and place them in places that look natural in your terrain. You may use other types of large plants also. There should be at least 5 instances of each prefab (i.e. at least 25 trees in total) – preferably quite a few more! Mix things up by changing individual instances, using rotation, scaling, or altered materials, etc., so that all of the trees don't look exactly the same from one point of view.
4. **Baron's Castle**: Use **ProBuilder** to create a simple castle model and place it onto your terrain. The castle should have outer walls, and an inner keep. Place doorways and windows in the keep. The outer wall should have a gate or opening to get into the castle. You should also place some archer firing ports (embrasures) or other battlements in your castle's outer walls. Make your castle design believable! Note: Texturing your castle with diffuse and normal maps will make it more realistic, but this is not required for full credit.

CHOICE FEATURES (Pick 1 of 3). Your game must implement **1 of 3** choices listed in this section. Each feature in this section is worth **16%** of the assignment grade. You may also implement a second feature for **10% extra credit**.

5. **Small Village**: Near the castle, create a small village for farmers and peasantry. The village should contain at least 2 distinct types of houses (e.g. 2 prefabs) with 6 (or more) instances. Include at least 4 other types of interesting objects in and around the village area, such as crates, barrels, anvils, fences, or anything else that is believable to the period. Put a dirt road through your village – presumably it is a well-used area.
6. **Crash Site**: Create a crash site some distance away from the village for Jammo's ship. Find or create an interesting spacecraft model and import it into the project. Your spacecraft should

be suitable for 1 or 2 pilots. (Think *Razor Crest*-size rather than *Star Destroyer*-size!) Position the craft to look like it has crashed into the terrain. Perturb the terrain height map around the crash site to look like the ship has dug into the terrain, creating a crater. Paint part of the terrain black to suggest scorch marks around this crater. Add at least 4 types of objects to look like debris have been littered around or ejected from the crash site. Make your crash site look believable!

7. **Areas of Water**: Add water to your scene in at least two places: Place water in a moat around the Baron's Castle. In another place on the terrain, create a small pond or lake. Paint a shoreline onto the terrain around each of these water areas. Place a small boat on the shoreline of the pond. Make your water look believable, using realistic colors, shaders, and translucency. Hint: You may want to search for water assets in the Unity Asset Store.

PRODUCTION Values. Try to make your scene believable, aesthetically pleasing, and period correct! Creativity and aesthetic design are worth **10%** of the assignment grade.

README File. Please provide a **thorough readme file** outlining what you implemented, with additions, omissions, and known errata in your program. Indicate which "choice" components were implemented and any new key mappings that are required for the player. Finally, include the installation procedure for your program, as well as the rendering pipeline that you are using. Quality of documentation is worth **10%** of the grade.

PROJECTS MUST RUN! Please test that your submission files work in a fresh install according to your instructions. Use a fresh directory/new project to test it. Points will be deducted if your homework doesn't install easily or work properly on the test computer!