The University of Melbourne
School of Computing and Information Systems
COMP30019 Graphics and Interaction

Set: Friday 30th August

Project 2, 2019

Gameplay Video (1-2 minute video): 4pm, Fri. 18 October
Final Electronic Submission (project): 4pm, Sun. 27 October

Marks: This project counts towards 30% of the marks for this subject

Participants: This project should be completed in groups of 3-4 people.

Assessment: Marking will be the same regardless of the number of participants.

Aim

The purpose of the project is to expose you to user interfaces and three-dimensional graphics programming. You will develop a **simple game** using Unity. You are free to choose any type of game that your group would like to develop, and we are happy to discuss these possible projects with you before you begin implementation.

Your Task

Your task will involve questions of

1. how to facilitate user interaction,
2. how to create and render objects/entities,
3. how to elegantly provide a camera which sensibly displays the action,
4. how to effectively manage the graphics pipeline so that it runs without substantial lag.
5. how to evaluate your game with participants, and make improvements based on the collected information.

Specification and Marking Criteria

As stated above, we have provided you with a great deal of freedom in what you make. In particular, you are not necessarily required to implement *all* of the entities and functions present in your intended game if you choose not to. For example, you may choose to only utilise a core subset of functionality. However, the game must still be usable/playable, as well as polished.

Gameplay [7 marks]

- Instructions are well specified within the game and controls respond as expected
- The game has a clearly defined objective, with the player being able to progress towards and achieve that objective
- Gameplay is well executed, bug-free, and operates at a reasonable frame rate (sufficient to play the game)
- The gameplay and control scheme are polished, easy to use, enjoyable and suit the design of the game

Graphics [5 marks]

- Objects and entities should be clearly visible, and clearly distinguishable
- Objects, entities, textures, lighting and user interfaces should suit the style of the game, and there should be consistent aesthetics employed throughout the game
- Camera orientation, positioning and motion should be comfortable and well-polished

Shaders & Special Effects [8 marks]

- At least two clearly distinct custom Cg/HLSL shaders should be present which appropriately enhance the game's visuals. At least one shader should produce a non-trivial effect *not* explored in the labs. For example, Cel shading, water effects, fog, or other artistic effects as desired. Descriptions of how the shaders work must be clearly detailed in the report. It should be made clear how the use of a shader provides a benefit over an equivalent CPU based approach, if applicable.
- A particle system should be used to create suitable effects within your game.

Evaluation, Report, Video [10 marks]

- Use at least one querying technique to evaluate and then improve your game, with a minimum of 5 participants.
- Use at least one observational method to evaluate and then improve your game, with a minimum of 5 different participants.
- Overall quality of the delivered report.
- Effectiveness of the video demo in conveying the game's functionality. Creativity of the video demo.

Consultation via Discussion Forum

You are encouraged to ask questions, answer questions where possible and share examples of pseudocode and/or small examples of code that highlight the correct invocation of Unity commands or algorithmic/graphical/interaction techniques.

You are not allowed to exchange complete methods or classes. Remember that copying code from the Internet or from your colleagues will be considered cheating. Note that via electronic submission, your code will be checked for similarity between submissions and with code available over the Internet.

Milestones

- Establish a set of intermediate goals for your application (e.g. detailing the polygon mesh, camera transformations, evaluation, etc.) Break down the set into core functions and extras which you can attempt if time permits.

Submission (electronic submission)

Unity Project: Your code must compile and run on environment available in the tutorial rooms (Unity 2019.1.8).

Gameplay Video: In order for everyone to be able to check your project in action, you will need to submit a short gameplay video to YouTube demonstrating the key features of your game (1 to 2 minutes long). You can set the video to unlisted if you wish to prevent it from being viewed publicly, but please ensure that we can access it from the provided link without requiring any special permissions.

Report: You must include a report that describes your application, specifically what it does, how to use it, and how you evaluated and improved it. Several paragraphs of text under each of the following headings should be sufficient:

- Brief explanation of the game,
- How to use it (especially the user interface aspects)
- How you modelled objects and entities,
- How you handled the graphics pipeline and camera motion,
- Descriptions of how the shaders work,
- Description of the querying and observational methods used, including: 1) description of the participants (how many, demographics), description of the methodology (which techniques did you use, what did you have participants do, how did you record the data), and feedback gathered.
- Document the changes made to your game based on the information collected during the evaluation.
- A statement about any code/APIs you have sourced/used from the internet that is not your own.
- A description of the contributions made by each member of the group.

Important: if your project contains code from other sources, in particular from other web sites, you have to clearly indicate this in the report. Identify which classes or methods are your own and which are from a different source. Remember that copying code from the Internet or from your colleagues will be considered cheating. We will be checking for similarity between submissions and with code available over the Internet.

Delays

Make sure you deliver your work on time using LMS. Overdue delivery will result in a reduction of 10% of the marks (3 points) for each day of delay.