The purpose of this assignment is for you to demonstrate the real-time animation concepts and methods you have learned in an interactive movie

1. This assignment is strictly **individual** (no groupwork).

2. You must create an Interactive Movie using the animation concepts that you have learned. See the end for specifications.

3. You may use a higher-level graphics engine such as Unity or Unreal Engine 4 OR continue in modern shader-based OpenGL (version 3.0 and upwards). Assets such as characters and environments can be imported, but the movie should be constructed, and logic should be implemented by you (e.g., you can import a skinned character model, but not one that has full game logic for navigation).

4. The deadline for the assignment is the week of April 6th, 2020. On Monday 6th, you will be given your demonstration time, and you will be individually presenting to Rachel, and Goksu, during one of the scheduled demo times (to be confirmed). The presentation will consist of a description of your work along with a demonstration of the resulting program. Each required feature must be demonstrated with a clear explanation of the underlying mechanisms/principles of how you achieved it. The demonstration will last 15 minutes, and will be conducted online not in-person.

5. A written report, documenting your research, and implementation with screenshots, technical features, citations etc. is due on Friday, April 10th, 2020. It should include clear details and links of where the assets came from (character, scene, etc.), which parts were coded by yourself and which out-of-the-box features were used. It should be submitted via Blackboard. Please also capture your movie and include a youtube link, with "CS7GV5" in the title. The report is compulsory and worth approximately 10% of the assignment mark.

6. Do not wait until the last minute to start this final assignment. This assignment is the most **difficult** of all the assignments of this course, and will require some time to achieve. Be sure to attend labs and ask the demonstrators for help.

7. Be aware that demonstrating a program that was not created by you or not crediting out-of-the-box features and plugins is considered **cheating** and will be reported as such. The demonstrator will check if you understand the implementation of all the features of the movie.

Requirements and Examination

The required components are: 全做

- **Must have** 3-dimensional objects and views
- **Must be** 30 seconds or longer
- **Must have** a non-linear animated camera path
- **Must have** one reasonably realistically moving articulated animated character, as part of the story-line and visible during the camera path
    a. There must be multiple joints and children (e.g., arm links and fingers)
    b. The articulated character will be assessed to ensure it has a correct hierarchy and can move correctly according to its structure.
    c. It can use forward or inverse kinematics
    d. It does not have to be organic/human (i.e., can be a robot or object come to life)
- **Must have** an interactive element (e.g., character reacts to user throwing a ball, etc.)
- **Must clearly demonstrate** the following principles of animation in the context of the movie. Note: There should be 5 separate examples visible, and they should be part of the story-line and visible during the camera path.
    a. Squash and Stretch
    b. Ease in, Ease out
    c. Arcs
    d. Anticipation
    e. Exaggeration

The required components are worth approximately <u>25%</u> of the assignment mark. (If using OpenGL, the weighting for required components will be higher)

Additional Features: 选5个最简单的做

- The final <u>65%</u> (approx) will be given for research and execution of animation features
- These can include some of the following, or indeed others that you think of:

1. Motion Capture
2. Motion State Machines
3. Motion Editing – blending, transplanting, etc.
4. Facial animation using morph targets
5. Automatic lip-sync from text or audio
6. Stylized motion
7. Crowd Simulation
8. Gesture or personality modelling for the character
9. Complex/scripted camera motion
10. Interesting character behaviours/AI
11. Particularly imaginative narrative
12. Cloth Simulation
13. Advanced Particle systems
14. Physically-based animation

15. ??? your own imagination is the only limit

Note: The [approximate] marking scheme provided shows the maximum marks that can be obtained for each section if completed perfectly. Merely attempting a section does not imply the full score.

Some examples of top projects from the last years:

https://www.youtube.com/watch?v=FEHQAm7GVdM

https://www.youtube.com/watch?v=Wo0KYOZ13z0&feature=youtu.be

https://www.youtube.com/watch?v=vZGA1X72GYc&t=

https://www.youtube.com/watch?v=vUYDgKJfKmg&feature=youtu.be

https://www.youtube.com/watch?v=D5srmXN8GTs

https://www.youtube.com/watch?v=JNbnToPuskg&feature=youtu.be