School of Engineering and Computing Sciences
University of Durham
SM Computer Graphics – Summative Assessment

Coursework Description

In this coursework, you are required to develop a simple OpenGL program for people to visualize the 3D model of a small part of Durham City. You are expected to use OpenGL to implement the program. You can choose a suitable programming language, such as Java or Python, for implementation. Your implementation is required to be runnable on Microsoft Windows platforms. Note that no GUI (such as menu, button, scroll bar, and input box) is required.

Coursework Requirements:

- **Modeling:**
  - Construct 3D models for three selected buildings in Durham City.
  - Construct a simple 3D environment to represent the surroundings where the three selected buildings are located. Appropriate objects, such as landscape, pavement, road, cars and trees, etc., should be included to model certain key features of the surroundings.
  - Movable parts should be included in the selected parts of 3D environment and/or the 3D building models.
  - You can use simple polygon models and texture images for model and 3D environment construction.
- **Program:**
  - Implement a simple canvas for people to visualize the 3D environment and the 3D building models.
  - The implementation should include a virtual camera, proper light source(s) and a shading method.
  - Include simple interaction mechanisms (e.g. using hotkeys) for a user to examine the 3D environment by changing the orientation or the position of the virtual camera, and to alter the movements of the movable parts.

Assessment:

The assignment will be assessed by the following items, and the level of achievement in each item will be marked against the university's marking criteria:

https://www.dur.ac.uk/resources/university.calendar/volumeii/2013.2014/coreregsug.pdf

- The modeling of the three selected buildings in Durham City (20%)
- The 3D environment construction of the surroundings (10%)
- The modeling of the movable parts (10%)
- Completeness and adequacy of the design and the implementation of the program:
  - The light source setting and the shading of the graphics content (10%)
  - Proper display of the 3D environment and the 3D building models (10%)

    - The user manipulation mechanism of the virtual camera (10%)
    - The user manipulation mechanism of the movable parts (10%)
- Robustness of the implementation (10%)
- Extra computer graphics features included [e.g. implement techniques that you have learnt from the lectures but that are not part of the prescribed requirements] (10%)

Deliverables:

- All program source codes and any necessary files or programming libraries that are required to execute your programs.
- A picture (in JPEG format) showing the three selected buildings and their surroundings
- Three different screenshots (in JPEG format) demonstrating good aspects of your implementation
- A two-page report (in MS word or pdf format) which includes:
    - Description of how you match the coursework requirements and the assessment criteria
    - A list of the limitations of your design and implementation
    - Description of how you set up, install and use your programs
    - Description of the attached three different screen shots of your implementation
    - Justification for the extra computer graphics features included in your implementation
    - A statement describing what else you would want to add into your assignment to improve its quality if you had more time
    - A list of the public domain packages / source code that you have used in your coursework

Hand-in Date / Time: 25 Feb 2013 at 14:00

For submission, all coursework files should be zipped into a single compressed file before submitting through DUO. You are responsible to make sure that there is no missing item in your submission.

Note: Be aware of plagiarism rules (https://www.dur.ac.uk/learningandteaching.handbook/6/2/4/).