**3D COMPUTER GRAPHICS AND ANIMATION**

**PROGRAMMING ASSIGNMENT 5**

**Difficulty: 3.5/5**

Create an application that simulates the viewing of the “boring house” (with the coordinates as shown in the PPT file).

By default, a parallel projection at the plane is used for the view; when the program runs, a pentagon should be seen.

The default view has the following viewing parameters:

**Viewing Parameter Value**

Window

Projection type Perspective

The program must be able to:

* Change the camera view. This is done by allowing the user to change the values of VRP, VPN, VUP, COP, and window edge coordinates.
* Clip parts of the “house” that are out of the view volume.
* View other objects (not just a “house”) by opening the data of some object from a file.
* Bonus points for user friendliness. Negative points for extreme user unfriendliness..

What to submit:

* An executable file
* The source code (and other libraries/files if necessary)
* A report.

The report should contain the following:

1. Introduction.

* Explain what the program is about.
* Explain in what language the program is implemented.

1. Basic theory.

* Explain how to transform a 3D object into a 2D image.
* Explain WCS and VCS.
* Explain the parameters required to convert the WCS into VCS.
* Explain how to normalize perspective projections.

1. Implementation

* Explain the main interface of the program and the components on the interface.
* Explain every feature in the program and how to use them.

1. Design

* Explain the main data structures (if any) used in the program.
* Explain the main/global variables used in the program.

1. Evaluation

* Evaluate various cases (look at the examples in the PPT file). Include screenshots for each case.
  + Explain how to obtain a one-point perspective projection.
  + Explain how to obtain a two-point perspective projection.
  + Explain how to obtain a three-point perspective projection.

1. Work log.

* Record the date and time of every moment you work on this assignment and job description of each member at each session. The work log should be a table with the following columns:
  + Date
  + Activity / progress
  + Personnel involved
* Write a summary of the implementation of each requirement given in the first page. For each requirement, explain whether that requirement is fully implemented, partially implemented, or not implemented at all. Give explanations if necessary.

1. Conclusion and remarks.

* Explain whether the program works as expected.
* If some parts of the program do not work as expected, explain why.
* What are your comments about this assignment?

Week 1

* The boring house can be displayed for any parameter values, excluding the front and back planes.

Week 2

* Parts of the boring house outside the view volume are clipped out.

Submit the assignment no later than midnight, 25 October 2020, to x60880@yahoo.com.