CptS **122 – Data Structures**

Programming Assignment 9: A Graphical Game or Application

Assigned: Wednesday, April 12, 2017
Due: Wednesday, April 26, 2017 by midnight

I. Learner Objectives:

At the conclusion of this programming assignment, participants should be able to:

- Design, implement and test classes in C++
- Apply game or application design principles
- Implement and apply inheritance and polymorphism
- Apply graphics to a solution

II. Prerequisites:

Before starting this programming assignment, participants should be able to:

- Analyze a basic set of requirements for a problem
- Compose basic C++ language programs
- Describe what is *inheritance*
- Create basic test cases for a program
- Apply arrays, strings, and pointers
- Declare and define *constructors*
- Declare and define *destructors*
- Compare and contrast *public* and *private* access specifiers in C++
- Describe what is an *attribute* or data member of a class
- Describe what is a *method* of a class
- Apply and implement *overloaded* functions
- Distinguish between pass-by-*value* and pass-by-*reference*
- Discuss *classes* versus *objects*

III. Overview & Requirements:

NOTE: I will be grading your assignment! Please be sure to clearly identify your team members and corresponding lab sections in a readme.txt file that is added to your "Resource Files" folder in your project. Only *one* of your team members will be required to submit a solution!!! Since some of your solutions will exceed the upload limits accepted by Blackboard Learn, you will need to transfer your solution to my computer via a flash drive.

For this final assignment, you are required to create a solution, as a team (you may have a team of up to 4 members), to a game or graphical application of your choice! Some game possibilities are listed below:

- Chess
- Texas Hold 'em
- Battleship
- Checkers
- Others?

Your goal for the assignment is build a complete graphical, and possibly networked, game or application. As a team you must ultimately decide how you will implement graphics. You have many tools and library options available to implement the graphics portion of the assignment. Some include the Unreal Engine, SFML, Qt, SDL, Allegro, DirectX, OpenGL, etc. Please be sure to also add some directions of how to play the game or use your application.

Aside from the requirements listed in the above paragraph, you are free to complete this assignment as you see fit. During our normally scheduled class period on Wednesday, April 26, we will have a Gamefest! At which point you will need to allow other students in the class play your game or use your application.

Have fun with this assignment!

IV. Submitting Assignments:

1. Only *one* of your team members will submit your assignment solution using Blackboard Learn https://learn.wsu.edu/webapps/login/. Specifically, you will need to submit to the *lecture* section of CptS 122: Data Structures C/C++ (Data Structures C/C++ (2017-SPRI-PULLM-CPT_S-122-3022-LEC). Next, click the "Content" link and navigate to the "Programming Assignment Submissions" folder and upload your solutions to the appropriate “Programming Assignment 9” space. You must upload your solutions as <your last name>_pa9.zip by the due date and time.
2. Your .zip file should contain a project workspace. Your project folder must have at least one header file (a .h file), two C++ source files (which must be .cpp files), and project workspace. Delete the debug folder before you zip your project folders.
3. Your project must build properly. The most points an assignment can receive if it does not build properly is 200 out of 300.

V. Grading Guidelines:

This assignment is worth 300 points. Your assignment will be evaluated based on a successful compilation and adherence to the program requirements. We will grade according to the following criteria:

- 25 pts – Appropriate design, style, and commenting according to class standards
- 100 pts – Design and implementation of main game play or application (along with user directions of how to play). **You must apply inheritance and polymorphism!**
- 100 pts – Implementation of graphics
- 25 pts - Creativity and originality in implementation of the game/application
- 50 pts - Demo
- 50 pts BONUS - Implementation of network communication