

COSC 251 – Programming Languages

Project 1

Spring 2013

Objective: Create the core of the current programming paradigm - objects!

Your Task: In C (not C++!), you will be creating the functionality to implement objects, thus retracing the steps of computer scientists over 30 years ago.

Specifically, I would like you to create the ability to implement a class like we do in C++. Note, that I'm not expecting you to be able to do everything that C++ can do with a class, but I am expecting you to be able to show me some code that represents the baseline aspects of class structures: fields/variables and functions. The more functionality that you can bring to the table, the higher your grade. As a summary:

To get an 85:

- A “class” that includes fields and functions.

- A piece of demonstration code with a full class implementation of something simple (Rectangle, Student, etc.).

To get a 90: Add “instantiation”. This would include multiple constructors. An extra 5 points if you handle multiple constructors as functions with the same name but different number of parameters.

To get a 100: Add “object” variables to classes. This will require you to create two classes, and have one inside of the other (for instance a Point object inside of a Shape class).

To get a 110: Add public and private scope.

To get a 120: Add inheritance. (no hints from instructor or TAs here)

Some quick hints: you are going to need to leverage both structs and function pointers for this project. This project is challenging, do not put it off! You do not need to be able to mimic the syntax of C++ classes, just the functionality.

Deliverables: your source code and a one-page writeup of the approach that you've taken for your solution.

Learning Targets: struct usage, pointer manipulation, C usage, origin of the object-oriented paradigm.

Expectations: The code should be clean, concise, well-commented and correct. If you use an outside source, be sure to document that source. Significant use of outside sources will result in a deduction. Grading rubric will be provided a week ahead of the due date. You may work in pairs on this project - your partner may be in your section or in the other 251 section. Teammate selection emails due 2/1 by 5pm.

DUE: February 17th, 11:59pm via Blackboard.