CS&E 1222

Lab 4– Selection Lab Assignment – 20 points

- ✓ The *lab* must be accomplished solely by you:
  - ➢ DO NOT look at anyone's code other than your own, including code from another's student in your section or another section of the course, or any third party source, e.g. the Internet
  - ➢ DO NOT share or copy anyone else's code for any graded assignment
  - ➢ DO NOT work in pairs or groups
- ✓ All cases of academic misconduct will be reported to the *Committee On Academic Misconduct* (COAM).

Setting up the Programming Environment

Effective commenting and tabbing will affect your grade. The "style" of your program should follow the style of the sample programs in the lecture notes. Also see the example code from Lab #1. Your program should have the file name, your name, creation and last modification dates and a brief description of the program in the comments. ***In addition, read the document on "Commenting" found in the Content tab on Carmen under "Tutorials"***.

1. At the Linux command line type `mkdir lab4`. This will create a new directory named **`lab4`**. Work out of this directory. In order to do that, type `cd lab4`. This changes the current working directory to the directory **`lab4`**.
2. If you have created the directory **`lab4`**, then just type `cd lab4`.
3. Copy the file **`compare_solution.exe`** in the directory **`/class/cse1222/9643/lab4`** by typing

```
cp /class/cse1222/9643/lab4/compare_solution.exe .
```

Be sure to include ***9643*** (this is your course section indicator) and the period, ".".

Programming Assignment

Write a program **`compare.cpp`** that reads two points and reports if the first point is *above*/*below*/*left*/*right* or *equals* the second point.

1. Type "`emacs compare.cpp &`" (without the double quotes) at the terminal to create a new file, **`compare.cpp`**.

2. Prompt and read in the (two) coordinates, (x_1, y_1), of the first point. The coordinates are not necessarily integers.

3. Prompt and read in the (two) coordinates, (x_2, y_2), of the second point. The coordinates are not necessarily integers.

4. Print out one of the following messages depending on the relative location of the first and second points.

    - Point (x_2, y_2) is *above* and *right* of point (x_1, y_1).
    - Point (x_2, y_2) is *below* and *right* of point (x_1, y_1).
    - Point (x_2, y_2) is *right* of (x_1, y_1).
    - Point (x_2, y_2) is *above* and *left* of point (x_1, y_1).
    - Point (x_2, y_2) is *below* and *left* of point (x_1, y_1).
    - Point (x_2, y_2) is *left* of point (x_1, y_1).
    - Point (x_2, y_2) is *above* point (x_1, y_1).
    - Point (x_2, y_2) is *below* point (x_1, y_1).
    - Point (x_2, y_2) *equals* point (x_1, y_1).

(Replace (x_1, y_1) and (x_2, y_2) with the actual coordinates of the first and second points, respectively.)

Point (x_2, y_2) is below and left of point (x_1, y_1) if $x_1 > x_2$ and $y_1 > y_2$.
Point (x_2, y_2) is above and left of point (x_1, y_1) if $x_1 > x_2$ and $y_1 < y_2$.
Point (x_2, y_2) is left of point (x_1, y_1) if $x_1 > x_2$ and $y_1 = y_2$.
Point (x_2, y_2) is below point (x_1, y_1) if $x_1 = x_2$ and $y_1 > y_2$.
Similar relationships hold for the other outputs.

5. Test your program against the program **`compare_solution.exe`**. The input and output of your program should match the input and output of the solution.

6. Test your program on various inputs. Make sure that you check each case, i.e., *above* and *left*, *below* and *left*, *left*, *right* and *above*, etc.

7. Be sure to add the header comments "File", "Created by", "Creation Date" and "Synopsis" at the top of each file. Each synopsis should contain a brief description of what the program does (read the document on "Commenting" found in the Content tab on Carmen under "Tutorials").

8. Be sure to add header comments "Created by" and "Creation Date" at the top of each file.

9. Be sure that there is a comment documenting each variable.

10. Be sure that your *if* statements and blocks are properly indented.

Submit Your Work

Important: Any program which does not compile and run will receive no credit!
If you are not sure what this means please ask your instructor.

Submit the file **`compare.cpp`** using the *Lab4* drop box on Carmen. **DO NOT** submit the file **`a.out`**. **DO NOT** submit work from other assignments. This will not be graded.