

24-780 Engineering Computation

Problem Set 12

You need to create a ZIP file (It may appear as a compressed folder in Windows) and submit the ZIP file via the 24-780 Blackboard course. The file name of the ZIP file must be:

PS12-YourAndrewID.zip

For example, if your Andrew account is *hummingbird@andrew.cmu.edu*, the file name must be:

PS12-hummingbird.zip

If your ZIP file does not comply with this naming rule, you will automatically lose 5% credit from this assignment. If we are not able to identify who submitted the file, you will lose another 5% credit. If we finally are not able to connect you and the submitted ZIP file, you will receive 0 point for this assignment. Therefore, please make sure you strictly adhere to this naming rule before submitting a file.

The ZIP file needs to be submitted to the 24-780 Blackboard course. If you find a mistake in the previous submission, you can re-submit the ZIP file with no penalty as long as it is before the submission deadline.

Notice that the grade will be given to the final submission only. If you submit multiple files, the earlier version will be discarded. Therefore, if you re-submit a ZIP file, the ZIP file **MUST** include all the required files. Also, if your final version is submitted after the submission deadline, late-submission policy will be applied no matter how early your earlier version was submitted.

Make sure you upload your Zip file to the correct location. If you did not upload your assignment to the correct location, you will lose 5%.

The ZIP file needs to include:

- C++ source file of your program (ps12.cpp)

Submission Due: Please see Canvas.

START EARLY!

Unless you are already a good programmer, there is no way to finish the assignment overnight.

I know you will miss the assignments, but this is the last assignment of this course!

PS12

Download ps12.cpp. This program cannot be compiled as is. First you need to make a class hierarchy such that:

PrimitiveWithTwoPoints is a kind of Primitive.

PrimitiveWithPointAndRadius is a kind of Primitive.

Line is a kind of PrimitiveWithTwoPoints.

Box is a kind of PrimitiveWithTwoPoints.

Circle is a kind of PrimitiveWithPointAndRadius.

Make sure you can compile it.

The program is a very simple graphic-drawing tool. You first click two points, and then press L for inserting a line, B for a box, and C for a circle. Use virtual and override keywords so that primitives are drawn correctly.

Also use const qualifier where appropriate for full credit.

5 point bonus: Let each primitive have its own color (r,g,b). Since every primitive has its own color, member variable r,g,b must be in the base class. When the user presses 1 before pressing L, B, or C, the next primitive color must be blue (0,0,1), 2 for red (1,0,0), 3 for purple (1,0,1), 4 for green (0,1,0), 5 for cyan (0,1,1), 6 for yellow (1,1,0), and 7 for black (0,0,0). Also the dots showing where the user clicked must be drawn in the color of the next primitive so that the user can see what color primitive will be inserted next.

Test your code with one of the compiler servers and make sure you do not get a red line from the server. Also, your code may run fine on your environment, but that does not mean it runs ok on the grading environment. Be careful about runtime errors. Double check your program does not access outside of the range of the array, one glEnd() for glBegin(), do not delete a pointer that is not assigned a memory block, etc. Make sure you are not using an uninitialized variable.