24-780 Engineering Computation Problem Set 03

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 Canvas. The file name of the ZIP file must be:

PS03-YourAndrewID.zip

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

PS03-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 Canvas. 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.

The ZIP file needs to include:

- C++ source file of your program (ps3-1.cpp, ps3-2.cpp)

Do not include project files (.sln, .vcxproj, .xcodeproj etc.) in the zip file.

Submission Due: Please see 24780 Canvas page.

Make sure your program can be compiled with no error (no red lines) in one of the compiler servers. Don't wait until the last minute. Compiler servers may get very busy minutes before the submission deadline!

Double check that your file name of your Zip file and source file(s) comply with the specification. TAs grade your assignments with a grading script, but the script may not find your submission if the file name is not compliant, and the TA will need to stop the script and manually correct your file name(s). You won't want to be graded by a frustrated TA on top of 5% point deduction!

And,

START EARLY!

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

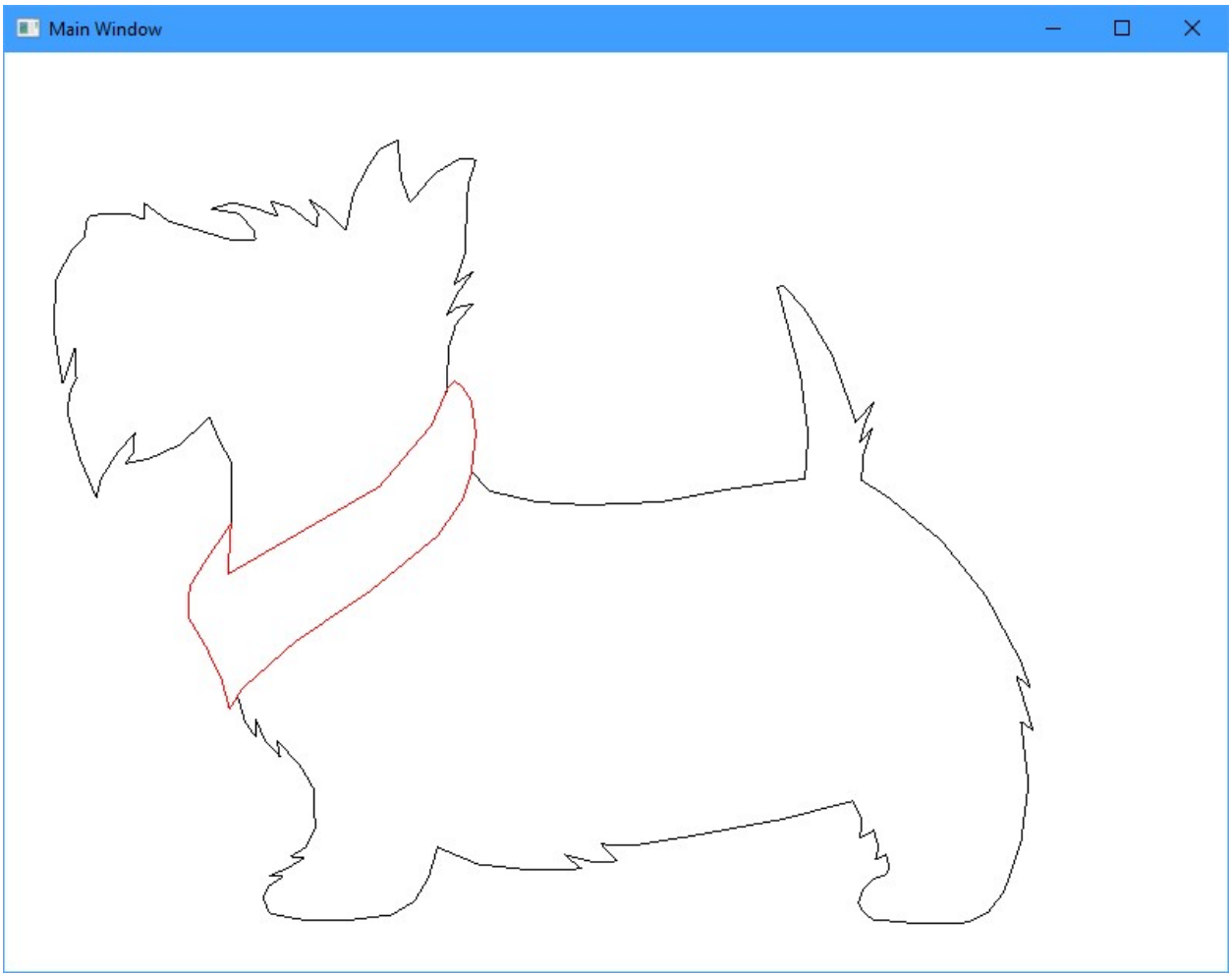
PS3-1 Draw Scotti (30 pts) [ps3-1.cpp]

Start with the base code (ps3-1.cpp) that includes coordinates of Scotti. In each array of integers, head, body, and scarf, elements [i*2] are X coordinates, and elements[i*2+1] are Y coordinates. Number of elements for head, body, and scarf are defined as headLen, bodyLen, and scarfLen in the base code.

Your program needs to open a 800x600-pixel wide window, and use GL_LINE_STRIP to draw Scotti. Head and body need to be black (all RGB components are zero), and scarf needs to be red (only red component is maximum intensity, blue and green are zero).

Save the C++ program (named ps3-1.cpp) and include it in the Zip file that you submit to the Canvas.

If you write your program correctly, you window will look like:



PS3-2 Drawing a clock (70 pts) [ps3-2.cpp]

In this problem, you write a program that:

(1) Takes hour, minute, and second from the console (you can use std::cin or scanf),
(2) Opens 800x600 graphics window, and
(3) Draws a clock.

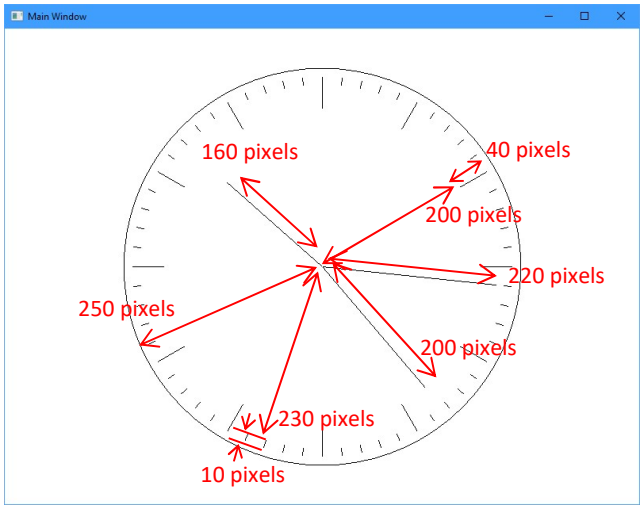
The user enters hour and minute separated by a space, not comma or other symbols. Assume that the user always enter two numbers separated by a space. You do not have to consider a wrong input (eg. having non-numeric characters, numbers separated by comma).

Your program must have a function called DrawClock that takes two integers as function parameters the first and second parameters for hour and minute respectively.

The clock must be centered at (400,300). Outer-circle radius is 250 pixels. Shorter tick mark must start from 230 pixels away from the center and 10 pixels long. Longer tick mark must start from 200 pixels away from the center and 40 pixels long. Hour-, minute-, and second- hands are 160, 200, and 220 pixels long respectively.

If the user enters "10 23 16" your graphics window must look like the following picture.

Hour- and minute-hands may point to in-between tick marks. Second-hand may point exactly at a tick mark if you take input as an integer. (You can take input as int or double of your choice.)



Write a C++ program (ps3-2.cpp) and include it in the Zip file that you submit to the Canvas.