2021 Fall CPSC 240-1

Midterm Programming Test #2

18 Nov 2021: 2:30pm – 4:30pm plus bonus time to 6:30pm

Take Home Test

General policies

We follow the same protocol as in the Midterm #1 Program.

Source code requirements

You must place this information in each submitted file:

```
Student name
CPSC240-01              //1 is the section number
Your email address
Program name            //You create a name like “Second Degree” or something
```

Inside the assembly file these are the requirements

```
Show the block structure with descriptive header for each block
Back up pushes and restore pops are required
Line-by-line comments may be omitted.
```

Near the end time save your source files including the bash file. If you edit in windows or mac remember to save the bash file with LF line endings. Mac uses line ending CR, Windows uses CRLF, and all others use LF to mark the end of a line. Bash files created in Mac or Windows will not execute when I receive them.

The easy solution is use a text editor provided by Tuffix or provided by WSL. Then there is no issue.

Grading standard: Software Industry standard.

When you are finished send me your source files along with the bash file to the usual address: holliday@fullerton.edu

In the space below add your name and email address

Problem description

Find the area of a triangle using Huron's formula.

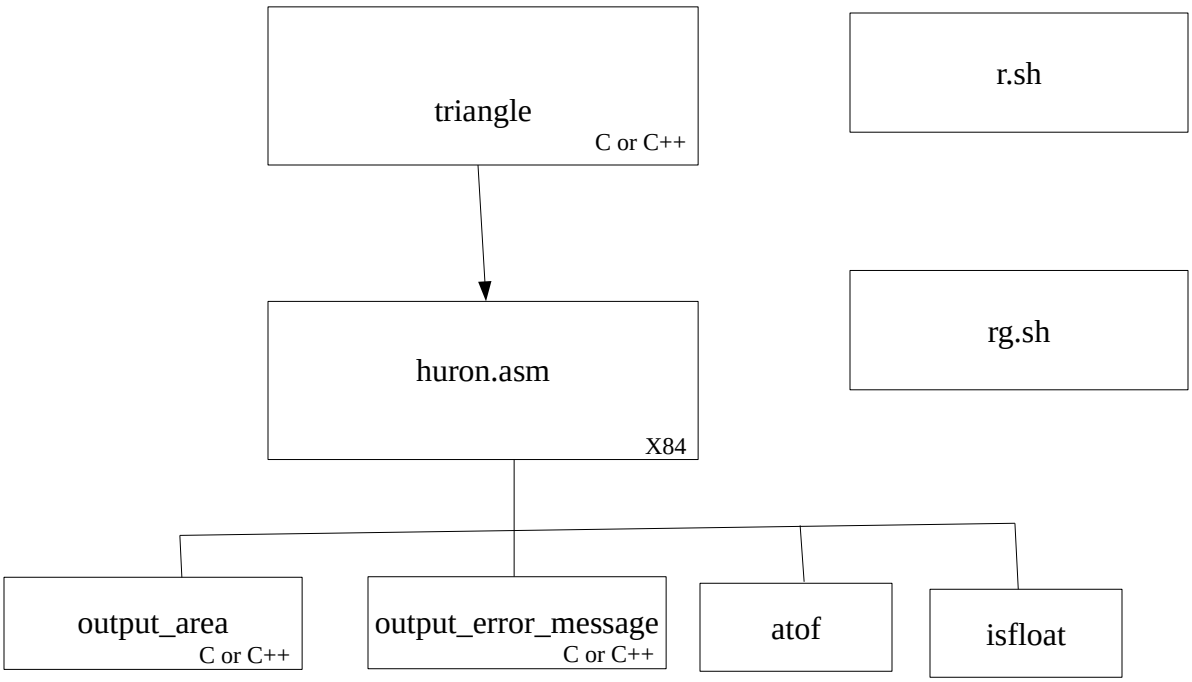
Somebody named Huron found a formula for computing the area of any triangle if only the lengths of the three sides are known.

Huron's formula is known in dozens of places on the web. For example, you can see it here: https://en.wikipedia.org/wiki/Heron's_formula

Your program will input 3 float numbers representing the lengths of three sides of one triangle. Then it uses Huron's formula to obtain the area.

For educational purpose we want to know that you know how to validate incoming numbers as true float numbers. Therefore, validate the first inputted number. You may omit validating the other two numbers. [If you can validate one input we assume you could validate all three.]

Program design



output_area receives one parameter of type double

output_error-message says "The inputted numbers do not form a triangle".

Dialog with out errors

Welcome to Triangle Areas by Esther Mendoza

We find any area
Please enter the length of the first side: 3.0
Please enter the length of the second side: 4.0
Please enter the length of the third side: 5.0

The three sides are 3.00000 4.00000 5.00000

The semi-perimeter is 6.000000

The area of the triangle is 6.00000000 Have a nice day.

The area will be returned to the driver.

The main program received this number 6.0000 and will keep it.
I hope you enjoyed this triangle program. A zero will be sent to the OS. Bye.

Color codes
Yellow: Main driver function “triangle”
Blue: huron.asm
Green: output_area.c or output_area.cpp or output_error_message.cpp

Obviously replace Ester’s name with your own name.

Dialog with error in the first coefficient

Welcome to Triangle Areas by Esther Mendoza

We find any area
Please enter the length of the first side: 3.9W45

Please enter the length of the first side: 5.6.24

Please enter the length of the first side: 8.44$

Please enter the length of the first side: 8.5
Please enter the length of the second side: 4.0
Please enter the length of the third side: 5.0

The area of the triangle is 9.9999999 Have a nice day.

The area will be returned to the driver.

The main program received this number 9.99999 and will keep it.
I hope you enjoyed this triangle program. A zero will be sent to the OS. Bye.

Input validation is applied only to the first side of the triangle.

////The number 9.9999999 is a place holder. I did not have time to compute a correct number.

Dialog with error in the size of the triangle

Welcome to Triangle Areas by Esther Mendoza

We find any area
Please enter the length of the first side: 1.0
Please enter the length of the second side: 42.0
Please enter the length of the third side: 5.0

The three sides are 1.00000 2.00000 5.00000

The semi-perimeter is 7.000000

The inputted numbers do not form a triangle. The area is set to zero.

The area will be returned to the driver.

The main program received this number 0.0000 and will keep it.
I hope you enjoyed this triangle program. A zero will be sent to the OS. Bye.

Conclusion

Send me one file for each box in the diagram of page 2 except for atof. There is no file for that function.

Send me two bash files. The second bash file is the gdb enabled bash file. I am going to use the gdb enabled file to test run your program.

You do not need to include any gdb commands. Only send me rg.sh as a gdb enabled bash file. Don't send any gdb commands.

Send all these files as attachments to the usual place: holliday@fullerton.edu

See you later

Next week there are no class meetings. Have a feast. Enjoy the food.

After the Thanksgiving vacation week there are very few assembly subjects remaining. We will probably study subnormal numbers and review the use of arrays. For the most part there is nothing more to present in lectures. See you later.