CS1336

Homework #4-2

Assigned March 23 , due March 30 at 11:59 PM

This homework assignment gives you the opportunity to practice menus, functions, conditional statements (what is meant by conditional statement is a statement such as if, if/else if, switch, and not necessarily a conditional ternary operator) and input validation.

HW4-2 (Graded out of 100)

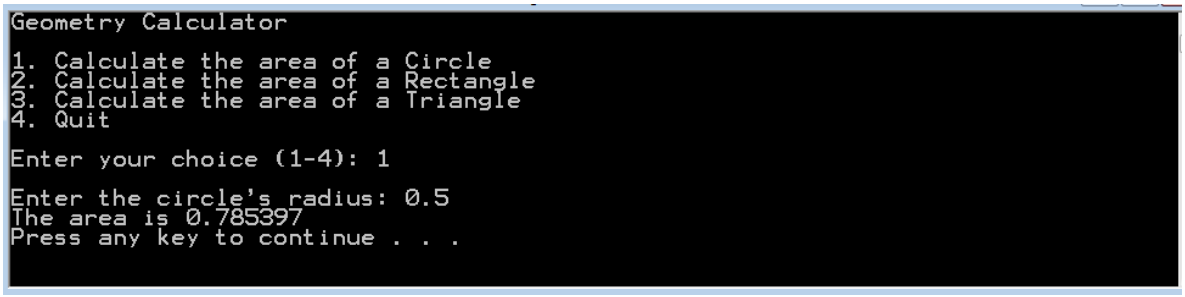
Exercise 23, page 225, Geometry Calculator

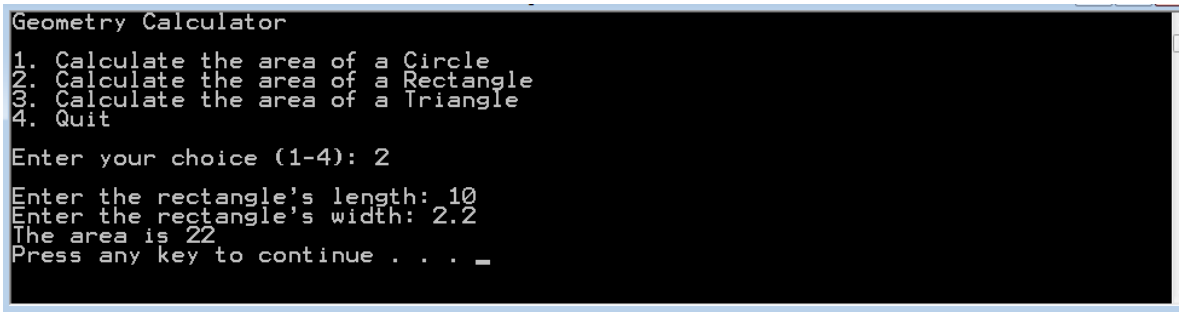
1. Additional requirements – Make sure you meet all the requirements to avoid losing points

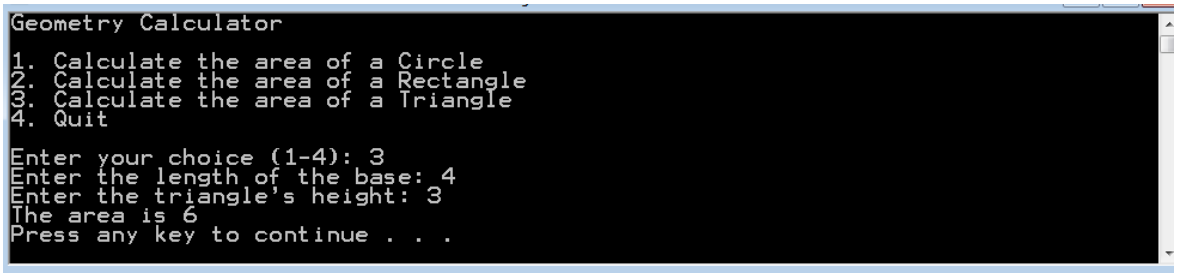
- To complete the assignment, you are **required to use only what has been taught in class**. If you have prior programming experience, refrain from using more advanced C++ constructs, so all the homework programs can be graded on a consistent basis.
- Make sure you follow the requirements in the "Homework Notes Function Headers".
- You are required to write the following functions and call them in the `main()` function
  - `getChoice`: displays the menu of choices, reads and returns the user's choice
  - `calculateCircleArea`: prompts the user to input the radius, performs input validation (radius cannot be negative). If input is valid, calculates the area and returns the result as a double. If input is invalid, print an error message and return -1. Do not ask the user to reenter an input. For consistency across the submissions, use this value for Pi: `const double PI = 3.14159;`
  - `calculateRectArea`: prompts the user to input the width and height, performs input validation (width and height cannot be negative). If input is valid, calculates the area and returns the result as a double. If input is invalid, print an error message and return -1. Do not ask the user to reenter an input.
  - `calculateTriangleArea`: prompts the user to input the base and height, performs input validation (base and height cannot be negative). If input is valid, calculates the area and returns the result as a double. If input is invalid, print an error message and return -1. Do not ask the user to reenter an input.
  - Your main() function implements the following pseudocode
    call getChoice to get the user's choice
    perform input validation on the user's choice (choice must correspond to a menu item) and call the appropriate function to calculate the area, or exit. Display the area if result returned is valid (not equal to -1). If the user's choice is not on the menu, print an error message.

2. Example Output

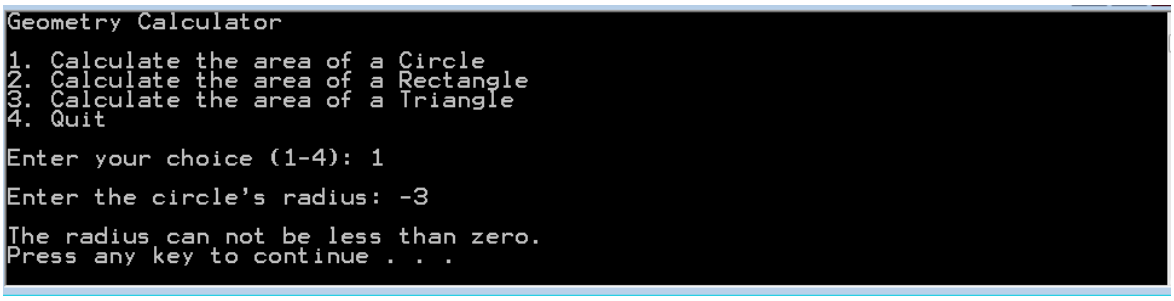
Here are some examples of output if your program is correct.

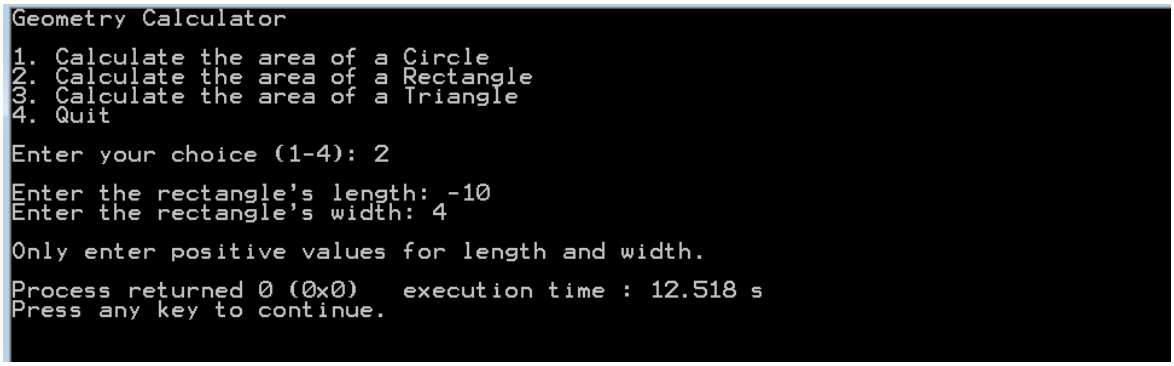

Geometry Calculator
1. Calculate the area of a Circle
2. Calculate the area of a Rectangle
3. Calculate the area of a Triangle
4. Quit
Enter your choice (1-4): 1
Enter the circle's radius: 0.5
The area is 0.785397
Press any key to continue . . .

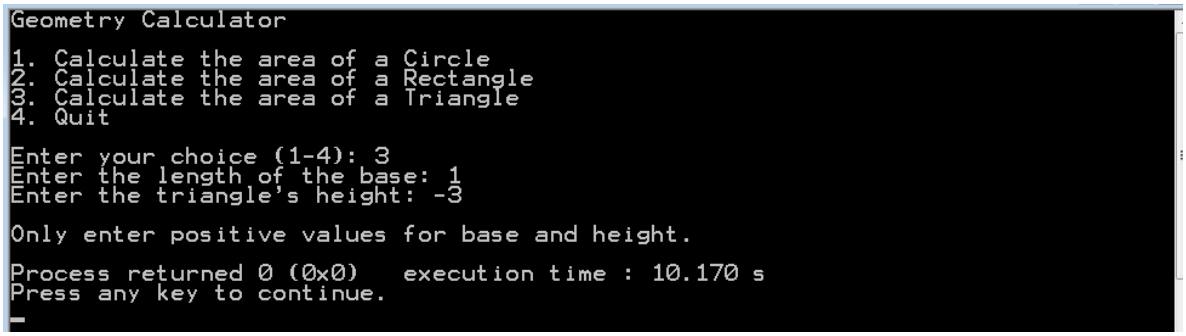

Geometry Calculator
1. Calculate the area of a Circle
2. Calculate the area of a Rectangle
3. Calculate the area of a Triangle
4. Quit
Enter your choice (1-4): 2
Enter the rectangle's length: 10
Enter the rectangle's width: 2.2
The area is 22
Press any key to continue . . .

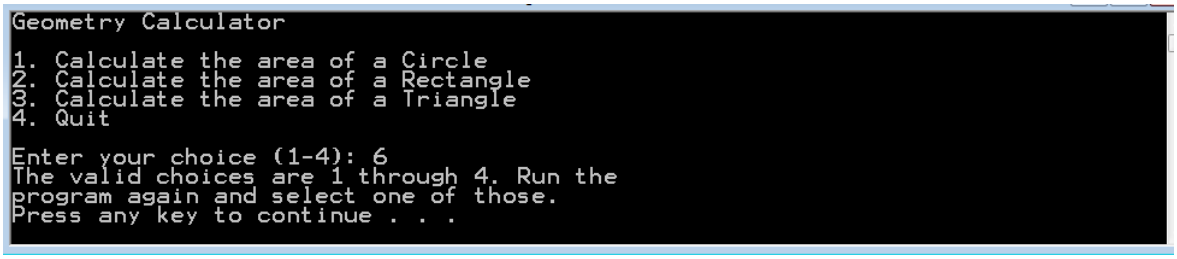

Geometry Calculator
1. Calculate the area of a Circle
2. Calculate the area of a Rectangle
3. Calculate the area of a Triangle
4. Quit
Enter your choice (1-4): 3
Enter the length of the base: 4
Enter the triangle's height: 3
The area is 6
Press any key to continue . . .


Geometry Calculator
1. Calculate the area of a Circle
2. Calculate the area of a Rectangle
3. Calculate the area of a Triangle
4. Quit
Enter your choice (1-4): 4
Program ending.
Press any key to continue . . .


Geometry Calculator
1. Calculate the area of a Circle
2. Calculate the area of a Rectangle
3. Calculate the area of a Triangle
4. Quit
Enter your choice (1-4): 1
Enter the circle's radius: -3
The radius can not be less than zero.
Press any key to continue . . .







Output of HW4-2