

ENGR0012 – Spring 2009
Programming Assignment 11
Review of Functions

Due: Tuesday April 14

In this assignment you will write a C program that will find the area of a circle or rectangle, or the volume of a box or a right cylinder. Please follow the program layout described below. The purpose of the program is to give you experience using function calls in C. Note, the program outline is not the most efficient design, however, it does require you to use all the various function call types.

Step one.

The main program should first call function 1. Function 1 should display a message that describes the purpose of the program. It should display some message that states that the program will find the area and the volume, and it should also state who wrote the program and the date it was written.

Step two.

Next the main should call function 2. Function 2 should display a menu that allows the user to select among the 4 possible tasks: 1) Area of a circle, 2) Area of a rectangle, 3) Volume of a box and 4) Volume of a cylinder. The user input should be returned to the main program. Check for user input error. Do not return a value other than 1, 2, 3 or 4.

Step 3.

Next the main should have an “if” statement to determine if the user wants to find the area or the volume. Within the “if” statement, have a switch case for the two different types of area, and a switch case for the two different types of volume. Within each case collect the required information to find the area and/or volume. For example, to find the area of a circle the user must enter the radius, for the volume of the box the user must enter the height, width and length, etc.

Step 4.

Use functions to find the area and volume. Have one function calculate areas and a different function calculate the volumes. Thus, function 3 should be passed the radius and return the area of the circle, or be passed the height and width and return the area of the rectangle. Think about how you are going to tell the function which of the two areas you want it to calculate. Function 4 should pass the height, width and length and return the volume of the box, or should be passed the radius and height and return the volume of a the cylinder.

Step 5.

Print out the results. After the program returns the result to the main, have a function 5 that prints out the results to the screen and to a output file. You should pass something that tells the function what the shape is, pass the user input data, and pass the computed result. Then function 5 should display all this data.

Step 6

Finally put the entire main program within a do-while loop that allows the user to find the area/volume of another shape. Do not display function 1 again. The program should ask the user: “Do you want to do this again (y/n)?” Use the toupper command to allow either lower or upper case letters. Have the program check for user error and only accept a y, Y, n or N. Remember you did this in Matlab.

Check the script as you design it to make sure it fits all the requirements. Have FUN!!!!!!!!!!!!

Also, you will be graded on programming style. Use whitespace, comments, indenting, etc.

Programming Assignment 11 - Evaluation Criteria

Names _____

Criteria	Points Available	Points Awarded
Program Style		
header in each function	10	
purpose/goal state in headers	10	
meaningful variable names	10	
variables defined w/ comment	10	
whitespace/readability	10	
algorithm comments	10	
pleasing user interface	20	
<u>Working Functions</u>		
Function 1	20	
Function 2	20	
If – switch in main	30	
Function 3	20	
Function 4	20	
Function 5 print to screen	10	
Function 5 print to a file	20	
Repeat loop	30	
	Total Pts:	/250