ESC 251 **HW 11** **Due: Sep. 27**

Remember to indent the bodies of your IF-THEN statements and looping structures.

1) (6 pts) Write a script that does the following:

   a) Asks the user to input three lengths a, b, and c

   b) Tests to determine if these lengths are capable of forming a triangle.

   c) If a triangle cannot be formed, an error message should be printed out. If (and only if) a triangle can be formed, your program should compute the area of the triangle using *Heron's formula*

$$A = \sqrt{s(s-a)(s-b)(s-c)}$$

   where s is the semi-perimeter of the triangle

$$s = \frac{a+b+c}{2}.$$

   Test your program with the 3 sets of data:

```
a = 4.1, b =  6.4, c = 10.1
a = 7.8, b = 12.0, c =  3.4
a = 1.1, b =  2.2, c =  3.3
```

   Do the results for the third case make sense?

2) (2 pts) Look up the `floor` function in MATLAB to see what this does. Write a script that will ask the user input a number and determine whether or not the number is an integer. Test your script using the values -3 and 10.7.

3) (3 pts) Write a program that will ask the user to input the x and y coordinates of a point in the x-y plane. The program should then compute the function

$$z = \begin{cases} \sin(x) + \cos(y), & 0 \le x^2 + y^2 < 5 \\ \cos(x) + \sin(y), & 5 \le x^2 + y^2 < 10 \\ \ln(x^2 + y^2), & x^2 + y^2 \ge 10. \end{cases}$$

   Test your program using the points $(1, 2), (2, -2), (3, 4)$.

4) (2 pts) Write a program that will ask the user to input an indicator variable named `flag` and a temperature, T. If the value of `flag` is 0, then the temperature is assumed to be in Fahrenheit and should converted to Celsius. If the value of `flag` is 1, then the temperature is assumed to be in Celsius and should converted to Fahrenheit. Test your program using the cases

```
flag = 1, T = 27.5
flag = 0, T = 212.4
```