Homework3:

Please name your program as P1.py, P2.py, …etc.

P1:

An arbitrary triangle can be described by the coordinates of its three vertices: (x_1, y_1), (x_2, y_2), (x_3, y_3), numbered in a counterclockwise direction. The area of the triangle is given by the formula

$$A = \frac{1}{2}\left|x_2y_3 - x_3y_2 - x_1y_3 + x_3y_1 + x_1y_2 - x_2y_1\right| . \qquad (3.8)$$

Write a function `area(vertices)` that returns the area of a triangle whose vertices are specified by the argument `vertices`, which is a nested list of the vertex coordinates. For example, `vertices` can be `[[0,0], [1,0], [0,2]]` if the three corners of the triangle have coordinates $(0, 0)$, $(1, 0)$, and $(0, 2)$. Test the `area` function on a triangle with known area. Name of program file: `area_triangle.py`. ◇

Test your function with the following statement:

area([[0,0],[1,0],[0,2]])

P2: Write a function sumoddnumber(numbers), where the input parameter is a list of integer numbers.

The function will add all the odd numbers in the numbers list and return the sum

Test your function by the following statement:

print “sum=”,sumoddnumber([2,5,7,4,8,3,5])

It should print out sum=15.

P3: write a function called minmaxave(numbers), which will calculate the maximum, minimum and average values of the given list of numbers and return them to the calling statement.

Test your function as below:

print minmaxave([3,5,2.3,5,10,4.2])

Should print out: 10, 2.3,4.916

P4: get keyboard input from user

Exercise 4.6. *Prompt the user for input to a formula.*

Consider the simplest program for evaluting the formula $y(t) = v_0 t - 0.5gt^2$:

```
v0 = 3; g = 9.81; t = 0.6
y = v0*t - 0.5*g*t**2
print y
```

Modify this code so that the program asks the user questions `t=?` and `v0=?`, and then gets `t` and `v0` from the user's input through the keyboard. Name of program file: `ball_qa.py`. ◇

P5: get input value from command line

Consider the simplest program for evaluting the formula $y(t) = v_0 t - 0.5gt^2$:

```
v0 = 3; g = 9.81; t = 0.6
y = v0*t - 0.5*g*t**2
print y
```

Write two programs that let users to input v0 and t from command line using the following two methods:

1) python p5.py 3 0.6, which will assign 3 to v0 and 0.6 to t.
2) python p5b.py –v 5 –t 0.8 , which will assign 5 to v0 and 0.8 to t. (use argparse module)

P6:

Modify the program p5b.py in P5 so that when user input wrong values for v0 and t, it will report an error and ask user to input it again using raw_input function. (use try-except statement)