MIS 6382
Object Oriented Programming in Python
Spring 2021
Homework Two

The following guidelines should be followed and will be used to grade your homework:

- The code for each question should be implemented using Jupiter notebook.
- This is an individual homework assignment; no group submissions will be accepted.
- Sample runs shown in the question should be used as a guide for implementation. However, extensive testing needs to be done on your code to deal with all test cases that might possibly be executed. In your homework, you don't need to showcase any sample interaction.
- **All the code should be included in one single Jupyter Notebook file (.ipynb) and submitted to eLearning.** The file should be named using your name and the chars "hw2", e.g. firstname_lastname_hw2. You will be penalized 15% of the grade if your submission does not follow these requirements.
- You will get zero points if your program has syntax errors.

Q1: Write a python program to sum of the first n positive integers after accepting the value of **n** from the user.

Below are some sample interactions

```
Enter a positive integer:0
You have entered an invalid number. Exiting the program.

Enter a positive integer:-2
You have entered an invalid number. Exiting the program.

Enter a positive integer:1
The sum of the first 1 positive integers is 1

Enter a positive integer:10
The sum of the first 10 positive integers is 55
```

Q2: An integer, greater than 1, that is only divisible by 1 and itself is called a prime number. All **other** numbers greater than 1 are called composite numbers. The integers 0 and 1 are neither prime nor composite. Write a python program that requests a positive integer from the user, determines if it is a prime, composite or neither prime or composite and prints the message.

Below are some sample interactions

```
Enter a positive integer:-1
You have entered an invalid number. Exiting the program.

Enter a positive integer:0
0 is neither prime nor composite

Enter a positive integer:1
1 is neither prime nor composite

Enter a positive integer:2
2 is a prime number

Enter a positive integer:3
3 is a prime number

Enter a positive integer:4
4 is a composite number

Enter a positive integer:5
5 is a prime number

Enter a positive integer:10
10 is a composite number
```

Q3: Write a program that takes as input two opposite corners of a rectangle: (x1,y1) and (x2,y2). Assume the sides of the rectangle are parallel to the x and y axes. Finally, the user is prompted for the coordinates of a third point (x,y). The program should print Boolean value True or False based on whether the point (x,y) lies INSIDE the rectangle. If the point lies ON or OUTSIDE the rectangle, the program should print False.

Below are some sample interactions

```
Enter x1:1
Enter y1:1
Enter x2:1
Enter y2:5
You have entered two points that fail to create a rectangle. Exiting the program.

Enter x1:0
Enter y1:0
Enter x2:3.5
Enter y2:3.5
Enter x:1.3
Enter y:3.5
False
```

```
Enter x1:4
Enter y1:4
Enter x2:0
Enter y2:0
Enter x:2
Enter y:2
True
```

Q4: Write a Python function called print_square() that accepts an integer as input and prints out the square of all numbers between 1 and that integer (both included). Then call the function from main() to get the value of n from the user. Note: Your submission MUST consist of the function definitions for both main() as well as print_square().

Below are some sample interactions. Don't need to handle float input or string input.

```
Enter a positive integer:-1
You have entered an invalid number. Exiting the program.

Enter a positive integer:1
The square of 1 is 1

Enter a positive integer:5
The square of 1 is 1
The square of 2 is 4
The square of 3 is 9
The square of 4 is 16
The square of 5 is 25
```