Hands-on Exercise-II (Python)

Using Keyboard Input

1. Write a python program that reads a Celsius degree in a **double** value from the console, then converts it to Fahrenheit and displays the result. The formula for the conversion is as follows:

Here is a sample run:

Enter a degree in Celsius: 43
43 Celsius is 109.4 Fahrenheit

2. Write a python program that reads an integer between **0** and **1000** and adds all the digits in the integer. For example, if an integer is **932**, the sum of all its digits is **14**.

Hint: Use the **%** operator to extract digits, and use the **/** operator to remove the extracted digit. For instance, **932 % 10 = 2** and **932 / / 10 = 93**.

Here is a sample run:

Enter a number between 0 and 1000: 999
The sum of the digits is 27

3. Body Mass Index (BMI) is a measure of health on weight. It can be calculated by taking your weight in kilograms and dividing by the square of your height in meters. Write a python program that prompts the user to enter a weight in pounds and height in inches and displays the BMI.
Note that one pound is **0.45359237** kilograms and one inch is **0.0254** meters.

Here is a sample run:

Enter weight in pounds: 95.5
Enter height in inches: 50
BMI is 26.8573

4. Write a python program that displays the following table. Cast floating-point numbers into integers.

a	**b**	**pow(a, b)**
1	2	1
2	3	8
3	4	81
4	5	1024
5	6	15625

5. Write a python program that prompts the user to enter two points **(x1, y1)** and **(x2, y2)** and displays their distance between them. The formula for computing the distance is $\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$.

Here is a sample run:

Enter x1 and y1: 1.5 -3.4

Enter x2 and y2: 4 5

The distance between the two points is 8.764131445842194

6. Write a python program that prompts the user to enter three points **(x1, y1)**, **(x2, y2)**, **(x3, y3)** of a triangle and displays its area. The formula for computing the area of a triangle is

$$s = (\text{side1} + \text{side2} + \text{side3})/2;$$

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

Here is a sample run:

Enter three points for a triangle: 1.5 -3.4 4.6 5 9.5 -3.4

The area of the triangle is 33.6

Accumulated value is $1043.92

7. If you have N eggs, then you have N//12 dozen eggs, with N%12 eggs left over. (This is essentially the definition of the // and % operators for integers.) Write a python program

that asks the user how many eggs she has and then tells the user how many dozen eggs she has and how many extra eggs are left over. A gross of eggs is equal to 144 eggs. Extend your program so that it will tell the user how many gross, how many dozen, and how many left-over eggs she has. For example, if the user says that she has 1342 eggs, and then your program would respond with

Your number of eggs is 9 gross, 3 dozen, and 10.

8. Write a python program that prompts the user to enter the minutes (e.g., 1 billion), and displays the number of years and days for the minutes.
For simplicity, assume a year has **365** days.

Here is a sample run:
Enter the number of minutes: 1000000000
1000000000 minutes is approximately 1902 years and 214 days

Using Command-Line Arguments

9. Write a python program that takes two positive integers as command-line arguments and prints **true** if either evenly divides the other.

10. Write a python program that takes two int values a and b from the command line and prints a random integer between a and b.

11. Write a python program that prints the sum of two random integers between 1 and 6 (such as you might get when rolling dice).

12. Write a python program that takes three double values x, y, and z as command-line arguments and prints true if the values are strictly ascending or descending ($x < y < z$ or $x > y > z$), and false otherwise.

13. Enter the basic salary of an employee of an organization through the command prompt. His dearness allowance (DA) is 40% of basic salary, and house rent allowance (HRA) is 20% of basic salary. Write a python program to calculate his gross salary.

14. Write a python program that takes two int values m and d from the command line and prints true if day d of month m is between 3/20 and 6/20, false otherwise.

****