

## Exercise 2 – Mathematical Operations and Keyboard Input

### Part A:

1. The **lines in green** are lines that should be written into a program exactly as you see them. The **lines in blue** indicate input you should enter in the console when the program is running.

```
x = input("Enter a number")
print type(x)
3.14
```

```
x = input("Enter a number")
print type(x)
x = float(x)
print type(x)
3.14
```

```
x = input("Enter a number")
print x
The cow jumped over the moon
```

### Part B: Writing programs

1. Write a program that asks the user for a year of birth and outputs their age in the current year. Save your program as age.py.
2. Write a program that inputs a first name and last name then outputs it in the form last name, first name. Save your program as firstLastName.py.

Example

```
Please enter you first name John
Please enter you last name Smith
Smith, John
```

3. Write a program that prompts the user for two integers and then prints

```
The sum
The difference
The product
The average
The maximum
The distance between the two numbers (using length formula)
The square, cube, and fourth power of the two integers
```

Save your program as integersOperations.py.

4. There are 2.54 cm in one inch. Write a program to input the length of a desk in inches and output its length in centimeters. Use a constant for the conversion factor. Be sure to prompt for the input and to label the output (i.e. give the output in the form of a sentence). Save your program as deskLength.py.

5. Write a program that reads in four numbers and then outputs the four numbers all on one line with commas between the numbers. Save your program as numbers.py.
6. Ask the user for a positive real number greater than 5 that will represent the radius of a circle. Use this number to calculate the area and the circumference of the circle. Use complete statements in each case. Save your program as areaOfCircle.py.
7. If TimeElapsed is the number of seconds between lightning and thunder, the storm is TimeElapsed / 5 miles away. Write a program that requests the number of seconds between lightning and thunder and reports the distance of the storm to 2 decimal places. Save your program as thunderAndLightning.py. (Use the round(x,ndigits) to round)
8. Write a program that converts a temperature in Fahrenheit to a temperature in Celcius. The formula is  $\text{tempFahrenheit} = 9 / 5 * \text{tempCelcius} + 32$

Example run:

```
Please enter the temperature in Celcius to convert: 15
15 degrees C = 59 degrees F
```

Other tests to run to ensure you're getting the correct answer:

-10C = 14F

0C = 32F

26C = 78.8F

Save your program as temperatureConversion.py.

### 9. **Another Conversion**

Write another conversion program that asks the user for a number in a particular unit and converts it to another unit.

Some choices are:

1 cup = 0.227 304 5 liter

1 gallon = 3.785 411 784 liter

1 Canadian Dollar = 0.73308 Euro

1 Canadian Dollar = 1.01107 US Dollar

12 hour time to 24 hour time

1 hour = 3600 seconds

1 lb, lbs = 0.453 592 37 kilogram

Save your program with a name of your choice.

10. Write a program to request the name of a baseball team, the number of games won, and the number of games lost as input, and then display the percentage of games won. Display the number as a percentage with no decimals. Save your program as winningPercentage.py.
11. The number of calories burned per hour by bicycling, jogging, and swimming are 200, 475 and 275 respectively. A person loses 1 pound of weight for each 3500 calories burned. Write a program that allows the user to input the number of hours spent at each activity and then calculates the number of pounds worked off. Save your program as triathlon.py.

12. The American College of Sports Medicine recommends that you maintain your training heart rate during an aerobic workout. Your training heart rate is computed as

$$0.7 * (220 - a) + 0.3 * r,$$

where 'a' is your age and 'r' is your resting heart rate (your pulse when you first awaken). Write a program to request a person's age and resting heart rate and then calculate the training heart rate. Save your program as trainingHeartRate.py.