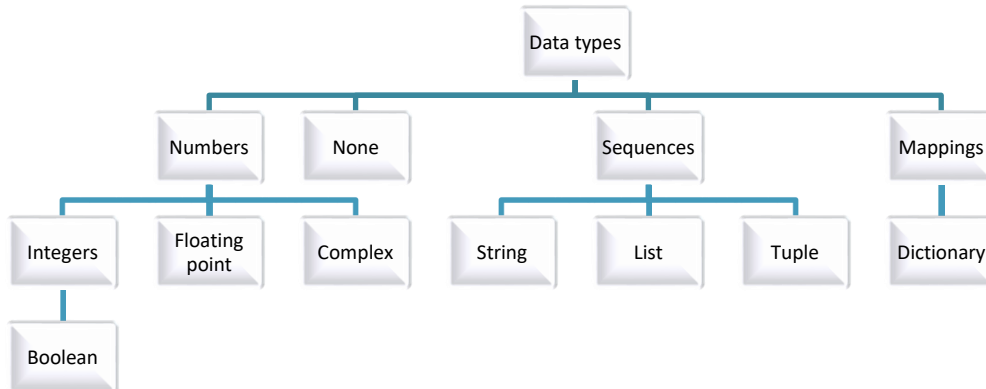**MSD Sanjeevani Public School, Mohan Garden**
Subject- Computer Science (with Python)
Class-12th (Non-Med)
Assignment-2 (from Ch-1: Python Revision Tour)

Q1 **What do you mean by data types in Python? Discuss.**

Ans   Data types are means to identify type of data (number, text, list etc.) and set of valid operators for it. Python offers following built-in data types

```
                          Data types
       ┌──────────┬─────────────┴───────────────┬──────────┐
   Numbers       None                      Sequences      Mappings
  ┌────┼─────┐                      ┌──────────┼─────────┐       │
Integers Floating Complex         String     List     Tuple  Dictionary
         point
   │
Boolean
```

Q2 **Explain mutable and immutable data objects in Python.**

Ans   **Mutable** or changeable or modifiable means that in the same memory address new value can be stored as and when you want. Eg List, dictionary.

Immutable or non-modifiable means these data object can never change their value in place. Eg. Integer, string, float, Boolean, tuples.

Q3 **Draw the table of operator precedence .**

Ans
( )	Parentheses
**	Exponent
+x, -x	Positive, negative (unary)
* / // %	Multiply, divide, floor division and remainder
+ -	Addition and Subtraction
> <= >= > ==<> != is is not	Relational operators and Identity operator
Not x	Boolean Not
And	Boolean And
OR	Boolean OR

Q4   What do you mean by implicit and explicit type conversion?

Ans   **Implicit type conversion** is a conversion **performed by the compiler**. It is also known as automatic type conversion. For example when we use
X,Y =10,12.5
Z=X+Y [The type of Z will be float as python converts all operands up to

the type of the largest operand (type promotion).

Explicit type conversion **or type Casting** is user-defined type conversion that forces an expression to be of specific type.

Eg. Y=12.9
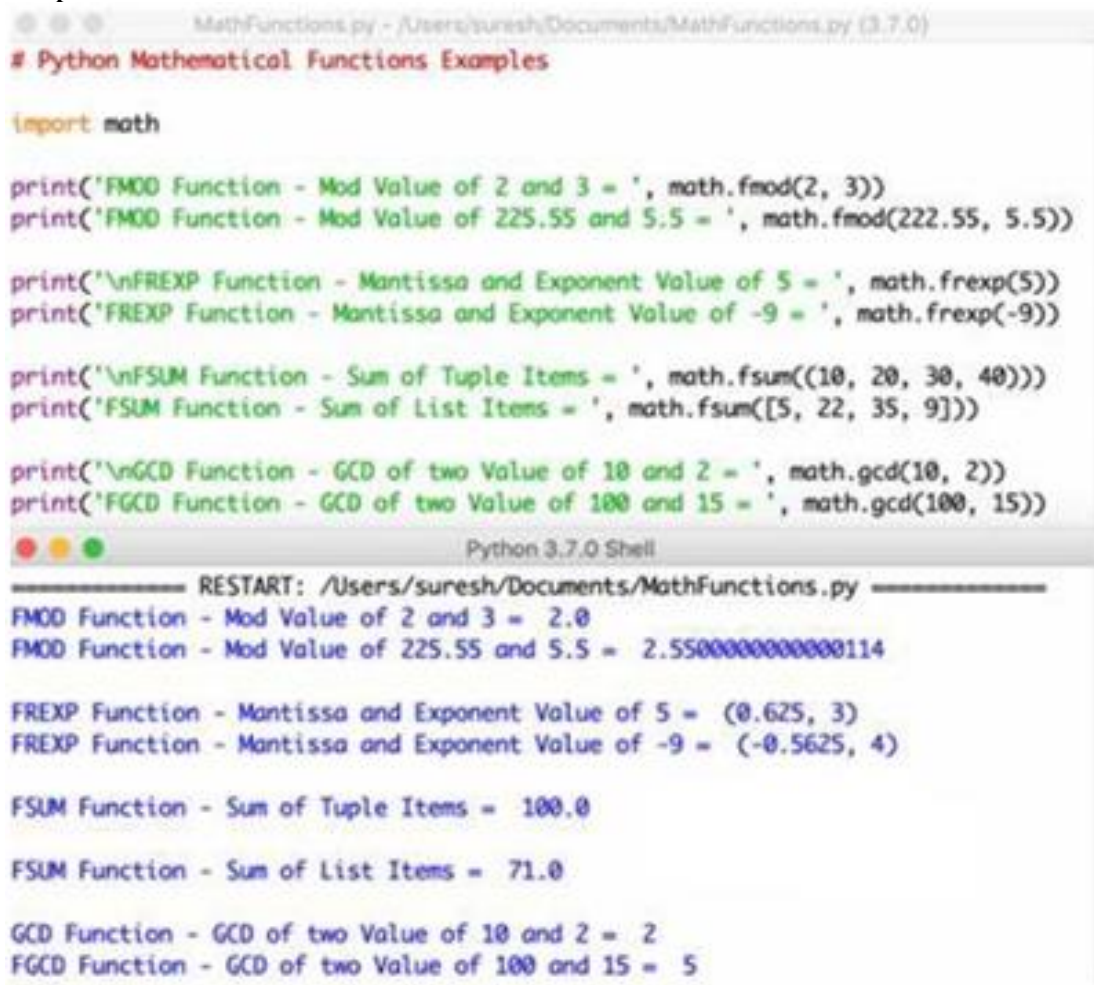
Z=int(Y) #explicit type conversion given by user

It will store 12 in Z

Q5 **Explain math module in python?**

Ans Python provides many built-in modules and related functions. Math module is used for numerical functions, but before to work with these functions **import math** statement must be applied and to use every function of module syntax is:

<modulename>.<functionanme>

Some important functions are given below with example statements and output:

```python
# Python Trigonometric Functions Examples
import math
print('COS Function - Cosine of 10 = ', math.cos(10))
print('COS Function - Cosine of -15 = ', math.cos(-15))

print('\nSIN Function - Sine of 3 = ', math.sin(3))
print('SINH Function - Sine of -5 = ', math.sin(-5))

print('\nTAN Function - Tangent of 9 = ', math.tan(9))
print('TANH Function - Tangent of -3 = ', math.tan(-3))

print('\nACOS Function - Arc Cosine of 1 = ', math.acos(1))
print('ACOS Function - Arc Cosine of -0.78 = ', math.acos(-0.78))

print('\nASIN Function - Arc Sine of 1 = ', math.asin(1))
print('ASIN Function - Arc Sine of -2 = ', math.asin(-0.42))

print('\nATAN Function - Arc Tangent of 0.72 = ', math.atan(0.72))
print('ATAN Function - Arc Tangent of -2.71 = ', math.atan(-2.71))

print('\nATAN2 Function - Tangent of 2, 5 = ', math.atan2(2, 5))
print('\nHYPOT Function - Hypot Value of 2, 3 = ', math.hypot(2, 3))
```

```
Python 3.7.0 Shell
=========== RESTART: /Users/suresh/Documents/MathFunctions.py ===========
COS Function - Cosine of 10 =  -0.8390715290764524
COS Function - Cosine of -15 =  -0.7596879128588212

SIN Function - Sine of 3 =  0.1411200080598672
SINH Function - Sine of -5 =  0.9589242746631385

TAN Function - Tangent of 9 =  -0.4523156594418099
TANH Function - Tangent of -3 =  0.1425465430742778

ACOS Function - Arc Cosine of 1 =  0.0
ACOS Function - Arc Cosine of -0.78 =  2.4654621440291318

ASIN Function - Arc Sine of 1 =  1.5707963267948966
ASIN Function - Arc Sine of -2 =  -0.43344532006888595

ATAN Function - Arc Tangent of 0.72 =  0.6240230529767569
ATAN Function - Arc Tangent of -2.71 =  -1.2172930308235297

ATAN2 Function - Tangent of 2, 5 =  0.3805063771123649

HYPOT Function - Hypot Value of 2, 3 =  3.605551275463989
```

```python
# Python Mathematical Functions Examples
import math

x = 10.98
y = 30.22
z = -40.95

print('FABS Function - Absolute Value of z = ', math.fabs(z))
print('FABS Function - Absolute Value of -124.897 = ', math.fabs(-124.897))

print('\ncopysign Function - copysign Value of x, z = ', math.copysign(x, z))
print('copysign Function - copysign Value of z, x = ', math.copysign(z, x))

print('\nCEIL Function - Ceiling Value of x = ', math.ceil(x))
print('CEIL Function - Ceiling Value of y = ', math.ceil(y))

print('\nFLOOR Function - Floor Value of x = ', math.floor(x))
print('FLOOR Function - Floor Value of y = ', math.floor(y))

print('\nFactorial Function - Factorial of 3 = ', math.factorial(3))
print('Factorial Function - Factorial of 5 = ', math.factorial(5))
```

```
Python 3.7.0 Shell
============ RESTART: /Users/suresh/Documents/MathFunctions.py ============
FABS Function - Absolute Value of z =  40.95
FABS Function - Absolute Value of -124.897 =  124.897

copysign Function - copysign Value of x, z =  -10.98
copysign Function - copysign Value of z, x =  40.95

CEIL Function - Ceiling Value of x =  11
CEIL Function - Ceiling Value of y =  31

FLOOR Function - Floor Value of x =  10
FLOOR Function - Floor Value of y =  30

Factorial Function - Factorial of 3 =  6
Factorial Function - Factorial of 5 =  120
```