Q: Write data types in python with few examples to support how you can use it in real world applications. Create jupyter note book for your practice.

Ans: There are several data types in Python.

**Numbers:**

In Python numbers category three data types are included.

1. Integers
2. Float
3. Complex

**List:**

List is an ordered sequence of items. It is one of the most used datatype in Python and is very flexible. All the items in a list do not need to be of the same type. In List, Items separated by commas are enclosed within brackets [ ].

**Tuple:**

[Tuple](https://www.programiz.com/python-programming/tuple) is an ordered sequence of items same as list. The only difference is that tuples are immutable. Tuples once created cannot be modified.

Tuples are used to write-protect data and are usually faster than list as it cannot change dynamically.

It is defined within parentheses () where items are separated by commas.

**String:**

[String](https://www.programiz.com/python-programming/string) is sequence of Unicode characters. We can use single quotes or double quotes to represent strings.

**Set:**

[Set](https://www.programiz.com/python-programming/set) is an unordered collection of unique items. Set is defined by values separated by comma inside braces { }. Items in a set are not ordered.

**Dictionary:**

[Dictionary](https://www.programiz.com/python-programming/dictionary) is an unordered collection of key-value pairs.

It is generally used when we have a huge amount of data. Dictionaries are optimized for retrieving data. We must know the key to retrieve the value.

In Python, dictionaries are defined within braces {} with each item being a pair.

Q: What you understand by module fraction. Perform some operations on it with examples?

This module provides support for rational number arithmetic. It allows to create a Fraction instance from integers, floats, numbers, decimals and strings.

Use of this module is illustrated at the end of Jupyter Notebook of this lecture.

Practice Problem 2.8

Q: In what order are the operators in the following expressions evaluated?

(a) 2 + 3 == 4 or a >= 5

First condition 2+3=4 is checked then it is checked whether a is greater or equals to 5.

(b) lst[1] \* -3 < -10 == 0

List’s 2nd element is multiplied by negative of 3 then then it is checked whether is is less than negative 10 and then it is checked that whether whole thing is equals to zero

(c) (lst[1] \* -3 < -10) in [0, True]

List 2nd element is multiplied by negative of 3 then it is checked whether it is less then negative of 10. Afterwards it is checked whether the answer is included in the list.

(d) 2 \* 3\*\*2

2 is multiplied by square of 3

(e) 4 / 2 in [1, 2, 3]

First,4 is divided by 2 and then it checked whether the answer (2) is in the list or not. Resulting true

Practice Problem 2.9

What is the type of the object that these expressions evaluate to?

(a) False + False : Integer

(b) 2 \* 3\*\*2.0 : Float

(c) 4 // 2 + 4 % 2 : Integer

(d) 2 + 3 == 4 or 5 >= 5 : Boolean