**List**

# 1. Introduction

* List is a sequence of values called items or elements. The elements can be of any data type. The Lists are mutable i.e. their elements can be changed.
* Creation :- In Python a list is created by placing all the items inside a square bracket [], separated by commas. It can have any number of items and they may be of different types like integer, float, string etc.
* Accessing :- it can be access in several ways. Generally we use the index operator [] to access an item in a list. Index starts from 0. So, a list having 10 elements will have index from 0 to 9.

# 2. List Operators

* Slicing [:] i.e. List[start:stop:step]
* Concatenation = +
* Repetition = \*
* Membership = in
* Identity = is

# 3. List Methods

* append() :- Add an element to the end of list
* count() :- Returns the count of number of items passed as an argument
* extend() :- Add all elements of a list to the another list.
* index() :- Returns the index of the first matched item.
* insert() :- Insert an item at the defined index.
* pop() :- Removes and returns an element at the given index.
* copy() :- Returns a shallow copy of the list  remove() :- Removes an item from the list
* reverse() :- Reverse the order of items in the list.
* sort() :- sort items in a list in ascending order

# Tuples

# 1. Introduction

* Tuples are very similar to lists, except that they are immutable i.e. they cannot be changed. They are created using parentheses instead of square brackets.
* Creation :- A tuple is created by placing all the items inside a parenthesis (), separated by comma. A tuple can have any number of items and they may be of different types (integer, float, list, string etc.)
* Accessing :- We can access the values in the tuple with their index, just as we did with lists. Nested tuple are accessed using nested indexing.
* Updating :- a tuple cannot be changed once it has been assigned. But, if the element is itself a mutable datatype like list, its nested items can be changed.
* Deleting :- we cannot change the elements in a tuple. That also means we cannot delete or remove items from a tuple but we can delete a tuple completely using ‘del’ keyword

# 2. Tuples Methods

* all() :- Return True if all elements of the tuples are true of if the tuple is empty.
* len() :- Return the length i.e. the number of items in the tuple.
* max() :- Returns the largest item in the tuple
* min() :- Returns the smallest element in the tuple
* sorted() :- take elements in the tuple and return a new sorted list.
* Sum() :- Return the sum of all elements in the tuple.

**Dictionaries**

# 1. Introduction

* A dictionary is mutable container which can store any number of python objects. Dictionaries are also known as associative arrays or hash tables.
* Dictionaries consists of pairs (items) of keys and their corresponding values. Each key is separated from its value by a colon (:).
* The items are separated by commas, and the whole thing is enclosed in curly braces { }.The values of a dictionary can be of any type, but the keys must be an mutable data type such as strings, numbers or even other data structures like list, tuples or even dictionaries.
* Accessing :- To access dictionary elements, we use square brackets [ ] along with the key to obtain its value.
* Updating :- we can update a dictionary by add a new entry or item with the help of key.
* Deleting :- We can either remove or delete individual dictionary elements or clear the entire contents of a dictionary. To delete or remove any element we use the ‘del’ keyword .

**2. Dictionary Methods.**

* clear() :- Removes all the elements from the dictionary.
* items() :- Returns a list containing a tuple for each key value pair.
* Keys() :- Returns a list containing the dictionary’s keys.
* Pop() :- Removes the element with the specified key.
* Update() :- updates the dictionary with the specified key-value pairs.

**Linear Regression**

1. **Problem statement:**

Write a program to predict Google stock price using scikitlearn API (Linear Regression)

1. **Introduction:**

The term ‘linearity’ in algebra refers to a linear relationship between two or more variables. If we draw this relationship in a 2D plane we get a straight line.

Linear regression performs the task to predict a dependent variable (y) based on a given independent variable (x). So this regression technique finds out a linear relationship between x (independent variable) and y (dependent variable).

For example, in a simple regression problem (a single x and a single y) would be:

y = B0 + B1\*x

Where,

y = dependent variable

x = independent variable

b0 = y-intercept

b1 = slope of the line

**Logistic Regression**

**Objective**: - Write a program in python using Logistic Regression to classify Iris dataset into different classes

**Theory**: -

* Logistic Regression is a form of regression that allows the prediction of discrete variables by a mix of continuous and discrete predictors.
* It addresses the same questions that discriminant function analysis and multiple regression do but with no distributional assumptions on the predictors ( the predictors do not have to be normally distributed, linearly related or have equal variance in each group)
* In Logistic Regression the outcome variable is binary, and the purpose of the analysis is to assess the effects of multiple explanatory variables, which can be numeric and/or categorical, on the outcome variable.

**Types of Logistic Regression**

* **Binary logistic regression**: - it is used when the dependent variable is dichotomous.
* **Multinomial Logistic Regression**: - It is used when the dependent variable has more

than two categories.

* **Binary Logistic regression expression** : -

**Y = b0** + b1X1 + b2X2 +…………..+bkXk + E

Where,

Y = Dependent Variables

X = Independent variables

b0 = Constant

bi = Coefficient of Variable of Xi

E = Error Term