**UNIT – 4**

**LIST, TUPLE, DICTIONARIES**

***Question Bank***

1. **Define list with example.**

List is an ordered mutable sequence data type in python. Sequence of elements it is separated by commas. Elements can be accessed based on index or based on element. List may contain heterogynous types of elements.

Eg: alist = [3, 5, 6, 2, 1]

1. **Define list traversing list the types?**

Traversing a list is known as method of accessing list elements by a sequence. For loop can be used to access the elements. There are two types of traversing index based traversing and element based traversing.

***Eg:***

alist = [3, 4, 5, 1, 2]

for i in range(len(alist)):

print(alist[i])

1. **How can we repeat the list?**

Repeating a list can be done with multiplying list with any numbers. \* operator is used to perform this operation. Repeating process gives new list that contains replicated values [no of times as given].

***Eg:*** alist = [1, 2, 3]

blist = alist\*3

print(blist)

***Output:***

[1, 2, 3, 1, 2, 3, 1, 2, 3]

1. **List down some list methods.**

|  |  |
| --- | --- |
| ***list.append(obj)*** | It appends the object at end of the list. |
| ***list.count(obj)*** | It returns the count of how many times the obj occurs in the list. |
| ***list.index(obj)*** | It returns the lowest index in list that obj appears. |
| ***list.remove(obj)*** | It removes the obj from the list |

1. **Write syntax for concatenating two lists with example.**

Combining two are more list is known as list concatenation. + operators is used to concatenate two lists.

***Eg:*** alist = [1, 2, 3]

blist = [100, 200, 300]

clist = alist+blist

print(clist)

***Output:***

[1, 2, 3, 100, 200, 300]

1. **Write a program that helps to display sum of numbers of given list without using list function.**

***Eg:*** alist = [1, 2, 3]

sum = 0

for element in alist:

sum = sum + element

print(“Sum is :”, sum)

***Output:***

Sum is : 6

1. **What is list slicing?**

List slicing is an operation to create a sub list from the source list. : operator is used to slice the list. Sliced list is an new instance created from source list. Changing the sliced list won’t affect the source list.

Synatax : new\_list = old\_list[start-index : end-index : step]

***Eg:*** alist = [1, 2, 3, 4, 5]

blist = alist[1:4:1]

print(blist)

***Output:***

[2,3,4]

1. **Define aliasing in list.**

The association of variable with an object is known as reference. If an object is assigned to more than one reference then it has more than one name, there for it is said that the object is aliased.

***Eg:*** alist = [1, 2, 3, 4, 5]

blist = alist

print(alist)

print(blist)

***Output:***

[1, 2, 3, 4, 5]

[1, 2, 3, 4, 5]

1. **What is list comprehension? Give an example.**

Python provides a concise way for building a list by embedding a for loop with in a brackets. This procedure is named as list comprehension. It is way of applying operation to the values in a sequence. It creates new list where each element is a result of applying a given operation to a value in a sequence.

***Eg:*** alist = [i\*\*2 for I in range(6)] # list of squares

print(alist)

***Output:***

[0, 1, 4, 9, 16, 25]

1. **Compare aliasing vs cloning the list.**

If variable is assigned to another variable is known as aliased. Change using second variable will reflect in actual variable too.

***Eg:*** alist = [1, 2, 3, 4, 5]

blist = alist

If a another instance of list is created from source list and assigned to another variable is known as cloning. Changes is the second list is not affects the source list. This is known as conning.

***Eg:*** alist = [1, 2, 3, 4, 5]

blist = alist[ : ]

1. **What is the use of remove method in list?**

Remove is an instance method of list. It will remove the element from the list.

Syntax = list.remove(obj)

***Eg:*** alist = [1, 2, 3, 4, 5]

print(alist)

alist.remove(2)

print(alist)

***Output:***

[1, 2, 3, 4, 5]

[1, 3, 4, 5]

1. **Define tuple with example.**

Tuple is an immutable sequence data type in python. It has all the features of list except mutability. It is also known as immutable list. Typically tuples are used to represent heterogeneous sequence of elements where list used to represent homogenous sequence of elements. Sequence represented with in ( ) brackets and elements separated by comas.

Syntax : (ele1, ele2, …)

***Eg:*** atuple = (1, 2, 3, 4, 5)

print(atuple)

***Output:***

(1, 2, 3, 4, 5)

1. **List down some tuple operations.**

|  |  |  |
| --- | --- | --- |
| ***concatenation*** | (1,2)+(3,4) | It concatenate two tuple’s creates new tuple sequence. |
| ***repetition*** | (2,3) \* 2 | It returns tuple contains duplicated elements of source that no of times specified. |
| ***membership*** | 2 in (2,3) | It check for membership and returns true or false |
| ***slicing*** | (2,3,4)[1:] | It creates sub tuple from source using index value |

1. **What is tuple assignment? Give an example.**

We can assign a tuple of values to tuple of variables left side of contains variables right side contains values. No of variables must equal to number of values otherwise it will show the ValueError.

***Eg:*** (x,y,z) = (1, 2, 3)

print(x)

print(y)

print(z)

***Output:***

1

2

3

1. **How can we return more than one value from python function?**

Typically a function or method returns only one value. If a function attempt to return more than one value then it returns in form of tuple.

***Eg:*** def sum\_finder(x,y):

sum = x+y

return (x,y,sum)

(x,y,ans) = (10,20)

print (“sum of {} and {} is {}”.format(x,y,ans))

***Output:***

sum of 10 and 20 is 30

1. **Write a program that swaps values without using third variable.**

***Eg:*** x = 10

y = 20

print(“Before swapping x={} and y={}”.format(x,y))

(x,y) = (y,x)

print(“After swapping x={} and y={}”.format(x,y))

***Output:***

Before swapping x=10 and y=20

After swapping x=20 and y=10

1. **Define dictionary with example.**

Dictionaries are unordered collection of objects. Each object is associated with key. Object is accessed using key only. They are unordered set of key : value pairs. Keys are immutable and unique.

1. **List down some methods of dictionary.**

|  |  |
| --- | --- |
| ***dict.clear()*** | It removes all the elements in dictionary. |
| ***dict.fromkeys(seq)*** | It returns a dictionary with keys specified in sequence and associated with default value “None” |
| ***dict.get(key)*** | It returns value associated with key. |
| ***dict.pop(key)*** | It removes the key value pair from the dictionary. |

1. **What is the use of items() method in dictionary?**

It returns all the key value pairs form the dictionary in the form of list of key and value tuples.

***Eg:*** x = [1:”Apple”, 2:”Mango”]

print(x)

print(x.items())

***Output:***

[1:”Apple”, 2:”Mango”]

[(1,”Apple”), (2,”Mango”)]

**PART – B**

1. **Explain in detail about list and operations performed in the list with example.**
2. **Explain in detail about various list methods with examples.**
3. **Explain about Selection sort and Insertion sort with example.**
4. **Explain about Merge sort with an example.**
5. **Explain in detail about tuples and its operations with example.**
6. **Explain in detail about dictionaries and its methods with example.**
7. **Write a program that helps to perform frequency analysis on string [find the characters number of occurrences in the string]. Order them and display low occurrence to high.**