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9. LISTS, TUPLES, SETS, AND DICTIONARY

Section – A

Choose the best answer

(1 Mark)

1. Pick odd one in connection with collection data type

- (a) List (b) Tuple (c) Dictionary **(d) Loop**

2. Let list1=[2,4,6,8,10], then print(List1[-2]) will result in

- (a) 10 **(b) 8** (c) 4 (d) 6

3. Which of the following function is used to count the number of elements in a list?

- (a) count() (b) find() **(c)len()** (d) index()

4. If List=[10,20,30,40,50] then List[2]=35 will result

- (a) [35,10,20,30,40,50] (b) [10,20,30,40,50,35] **(c) [10,20,35,40,50]** (d) [10,35,30,40,50]

5. If List=[17,23,41,10] then List.append(32) will result

- (a) [32,17,23,41,10] **(b) [17,23,41,10,32]** (c) [10,17,23,32,41] (d) [41,32,23,17,10]

6. Which of the following Python function can be used to add more than one element within an Existing list?

- (a) append() (b) append_more() **(c)extend()** (d) more()

7. What will be the result of the following Python code?

```
S=[x**2 for x in range(5)]
print(S)
```

- (a) [0,1,2,4,5] **(b) [0,1,4,9,16]** (c) [0,1,4,9,16,25] (d) [1,4,9,16,25]

8. What is the use of type() function in python?

- (a) To create a Tuple (b) To know the type of an element in tuple.
(c) To know the data type of python object. (d) To create a list.

9. Which of the following statement is not correct?

- (a) A list is mutable
 (b) A tuple is immutable.
 (c) The append() function is used to add an element.
(d) The extend() function is used in tuple to add elements in a list.

10. Let setA={3,6,9}, setB={1,3,9}. What will be the result of the following snippet?

```
print(setA|setB)
```

- (a) {3,6,9,1,3,9} (b) {3,9} (c) {1} **(d) {1,3,6,9}**

11. Which of the following set operation includes all the elements that are in two sets but not the one that are common to two sets?

- (a) Symmetric difference** (b) Difference (c) Intersection (d) Union

12. The keys in Python, dictionary is specified by

- (a) = (b) ; (c) + **(d) :**

Section-B

Answer the following questions

(2 Marks)

1. What is List in Python?

- A list is an ordered collection of values enclosed within square brackets [] also known as a “sequence data type”.
- Each value of a list is called as element.
- Elements can be a numbers, characters, strings and even the nested lists.
- **Syntax:** Variable = [element-1, element-2, element-3 element-n]

2. How will you access the list elements in reverse order?

- Python enables reverse or negative indexing for the list elements.
- A negative index can be used to access an element in reverse order.
- Thus, python lists index in opposite order.
- The python sets -1 as the index value for the last element in list and -2 for the preceding element and so on.
- This is called as **Reverse Indexing**.

3. What will be the value of x in following python code?

```
List1=[2,4,6,[1,3,5]]
```

```
x=len(List1)
```

```
print(x)
```

OUTPUT:

```
===== RESTART: C:/Users/SANJANASRI.SANJANASRI-PC/Desktop/Python/LI.py =====
```

```
4
```

```
>>>
```

4. Differentiate del with remove() function of List.

del	remove()
del statement is used to delete known elements	remove() function is used to delete elements of a list if its index is unknown.
The del statement can also be used to delete entire list.	The remove is used to delete a particular element

5. Write the syntax of creating a Tuple with n number of elements.

Syntax:

Tuple_Name = (E1, E2, E2 En) # Tuple with n number elements

Tuple_Name = E1, E2, E3 En # Elements of a tuple without parenthesis

6. What is set in Python?

- In python, a set is another type of collection data type.
- A Set is a mutable and an unordered collection of elements without duplicates or repeated element.
- This feature used to include membership testing and eliminating duplicate elements.

Section-C

Answer the following questions

(3 Marks)

1. What are the advantages of Tuples over a list?

- The elements of a list are changeable (mutable) whereas the elements of a tuple are unchangeable (immutable), this is the key difference between tuples and list.
- The elements of a list are enclosed within square brackets. But, the elements of a tuple are enclosed by paranthesis.
- Iterating tuples is faster than list.

2. Write a short note about sort().

sort ():

- It sorts the element in list.
- sort() will affect the original list.

Syntax : List.sort(reverse=True|False, key=myFunc)

Description of the Syntax:

Both arguments are optional ,

- If reverse is set as True, list sorting is in descending order.
- Ascending is default.
- Key=myFunc; “myFunc” - the name of the user defined function that specifies the sorting criteria.

3. What will be the output of the following code?

```
list = [2**x for x in range(5)]
print(list)
```

OUTPUT: [1, 2, 4, 8, 16]

4. Explain the difference between del and clear() in dictionary with an example.

del	clear()
The del statement is used to delete known elements	The function clear() is used to delete all the elements in list
The del statement can also be used to delete entire list.	It deletes only the elements and retains the list.

5. List out the set operations supported by python.

Set Operations:

(i) **Union:** It includes all elements from two or more sets.

(ii) **Intersection:** It includes the common elements in two sets.

(iii) **Difference:** It includes all elements that are in first set (say set A) but not in the second set (say set B).

iv) **Symmetric difference:** It includes all the elements that are in two sets (say sets A and B) but not the one that are common to two sets.

6. What are the difference between List and Dictionary?

List	Dictionary
<ul style="list-style-type: none"> A list is an ordered collection of values or elements of any type . 	<ul style="list-style-type: none"> A dictionary is a mixed collection of elements and it stores a key along with its element.
<ul style="list-style-type: none"> It is enclosed within square brackets [] 	<ul style="list-style-type: none"> The key value pairs are enclosed with curly braces { }.
<ul style="list-style-type: none"> Syntax: Variable = [element-1, element-2, element-3 element-n] 	<ul style="list-style-type: none"> Syntax of defining a dictionary: Dictionary_Name = { Key_1: Value_1, Key_2:Value_2, Key_n:Value_n }
<ul style="list-style-type: none"> The commas work as a separator for the elements. 	<ul style="list-style-type: none"> The keys in a Python dictionary is separated by a colon (:) while the commas work as a separator for the elements.

Section - D

Answer the following questions:

(5 Marks)

1. What the different ways to insert an element in a list. Explain with suitable example.

Inserting elements in a list using insert():

- The **insert ()** function helps you to include an element at your desired position.
- The **insert()** function is used to insert an element at any position of a list.

Syntax:

List.insert (position index, element)

Example:

```
>>> MyList=[34,98,47,'Kannan', 'Gowrisankar', 'Lenin', 'Sreenivasan' ]
>>> MyList.insert(3, 'Ramakrishnan')
>>> print(MyList)
```

Output: [34, 98, 47, 'Ramakrishnan', 'Kannan', 'Gowrisankar', 'Lenin', 'Sreenivasan']

- In the above example, insert() function inserts a new element 'Ramakrishnan' at the index value 3, ie. at the 4th position.
- While inserting a new element, the existing elements shifts one position to the right.

Adding more elements in a list using append():

- The **append()** function is used to add a single element in a list.
- But, it includes elements at the end of a list.

Syntax:

List.append (element to be added)

Example:

```
>>> Mylist=[34, 45, 48]
>>> Mylist.append(90)
>>> print(Mylist)
```

Output: [34, 45, 48, 90]

Adding more elements in a list using extend():

- The **extend()** function is used to add more than one element to an existing list.
- In extend() function, multiple elements should be specified within square bracket as arguments of the function.

Syntax:

List.extend ([elements to be added])

Example:

```
>>> Mylist=[34, 45, 48]
>>> Mylist.extend([71, 32, 29])
>>> print(Mylist)
```

Output: [34, 45, 48, 90, 71, 32, 29]

2. What is the purpose of range()? Explain with an example.

range():

- The range() is a function used to generate a series of values in Python.
- Using range() function, you can create list with series of values.
- The range() function has three arguments.

Syntax of range () function:

range (start value, end value, step value)

where,

- **start value** – beginning value of series. Zero is the default beginning value.
- **end value** – upper limit of series. Python takes the ending value as upper limit – 1.
- **step value** – It is an optional argument, which is used to generate different interval of values.

Example : Generating whole numbers upto 10

```
for x in range (1, 11):
```

```
print(x)
```

Output:

```
1
2
3
4
5
6
7
8
9
10
```

Creating a list with series of values

- Using the range() function, you can create a list with series of values.
- To convert the result of range() function into list, we need one more function called list().
- The list() function makes the result of range() as a list.

Syntax:

```
List_Varibale = list ( range ( ) )
```

Example :

```
>>> Even_List = list(range(2,11,2))
>>> print(Even_List)
```

Output: [2, 4, 6, 8, 10]

- In the above code, list() function takes the result of range() as Even_List elements.
- Thus, Even_List list has the elements of first five even numbers.

3. What is nested tuple? Explain with an example.

Tuple:

- Tuples consists of a number of values separated by comma and enclosed within parentheses.
- Tuple is similar to list, values in a list can be changed but not in a tuple.

Nested Tuples:

- In Python, a tuple can be defined inside another tuple; called Nested tuple.
- In a nested tuple, each tuple is considered as an element.
- The for loop will be useful to access all the elements in a nested tuple.

Example:

```
Toppers = (("Vinodini", "XII-F", 98.7), ("Soundarya", "XII-H", 97.5), ("Tharani", "XII-F", 95.3), ("Saisri", "XII-G", 93.8))
for i in Toppers:
    print(i)
```

Output:

```
('Vinodini', 'XII-F', 98.7)
('Soundarya', 'XII-H', 97.5)
('Tharani', 'XII-F', 95.3)
('Saisri', 'XII-G', 93.8)
```

4. Explain the different set operations supported by python with suitable example.

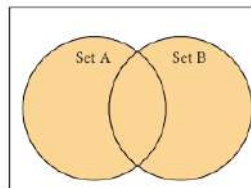
- A Set is a mutable and an unordered collection of elements without duplicates.

Set Operations:

- The set operations such as Union, Intersection, difference and Symmetric difference.

(i) Union:

- It includes all elements from two or more sets.
- The **operator** | is used to union of two sets.
- The function union() is also used to join two sets in python.



Example:

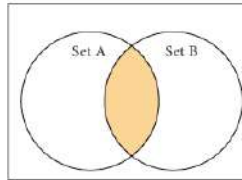
```
set_A={2,4,6,8}
set_B={'A', 'B', 'C', 'D'}
U_set=set_A|set_B
print(U_set)
```

Output:

```
{2, 4, 6, 8, 'A', 'D', 'C', 'B'}
```

(ii) Intersection:

- It includes the common elements in two sets.
- The **operator &** is used to intersect two sets in python.
- The function **intersection()** is also used to intersect two sets in python.



Example:

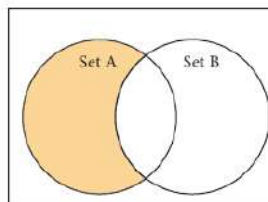
```
set_A={'A', 2, 4, 'D'}  
set_B={'A', 'B', 'C', 'D'}  
print(set_A & set_B)
```

Output:

```
{'A', 'D'}
```

(iii) Difference:

- It includes all elements that are in first set (say set A) but not in the second set (say set B).
- The minus (-) **operator** is used to difference set operation in python.
- The function **difference()** is also used to difference operation.



Example:

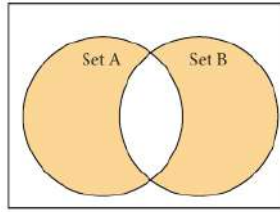
```
set_A={'A', 2, 4, 'D'}  
set_B={'A', 'B', 'C', 'D'}  
print(set_A - set_B)
```

Output:

```
{2, 4}
```

(iv) Symmetric difference

- It includes all the elements that are in two sets (say sets A and B) but not the one that are common to two sets.
- The caret (^) **operator** is used to symmetric difference set operation in python.
- The function **symmetric_difference()** is also used to do the same operation.



Example:

```
set_A={'A', 2, 4, 'D'}  
set_B={'A', 'B', 'C', 'D'}  
print(set_A ^ set_B)
```

Output:

```
{2, 4, 'B', 'C'}
```

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