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Assignment/Task

1. Is a list mutable?

Ans) Yes a list is mutable as we can add(by append or insert) or remove(by pop or remove or delete) elements from the list.

2. Does a list need to be homogeneous?

Ans) No lists need not to be homogeneous as we can have various data types in one list i.e. string, integer, float.

3. What is the difference between a list and a tuple.

Ans) A list is an ordered mutable data type as we can add(by append or insert) or remove(by pop or remove or delete) elements from the list whereas tuple is a an ordered immutable data type as we can neither add nor remove any element from tuple. A list uses square brackets [] **whereas** tuple uses round brackets or parenthesis ().

4. How to find the number of elements in the list?

Ans) To find number of elements in the list, we use len() method to find length of that particular list.

5. How to check whether the list is empty or not?

Ans) To find whether the list is empty or not, we can use len() method to find length of that particular list. If length is 0, then list is empty otherwise it is not empty.

6. How to find the first and last element of the list?

Ans) We can use 0 index for accessing the first element of the list and -1 to get last element of the list. We can also reverse list and find 0th index to search for last element and -1 index to seacrh for the first element in the list.

7. How to find the largest and lowest value in the list?

Ans) The inbuilt min() and max() functions can be used directly to find lowest and the largest values in a List. We can also sort the list and then we can access the first element to have the minimum values and the last element to access the maximum value.

8. How to access elements of the list?

Ans) To access the elements of list, we can iterate through a list with the help of a for loop. We can also use list slicing to access elements of the list.

9. Remove elements in a list before a specific index?

Ans) To remove an item from a specified index or position from a List, we can use pop(index) method of List to remove element from particular index of the list or we can use delete method to remove

multiple elements and remove methods to remove a particular value of the element without knowing it's index.

10. Remove elements in a list between 2 indices?

Ans) For removing elements in a list between 2 indices i.e. to remove multiple elements without knowing their index, we can use del method using slicing in python.
Example:

a=[10,20,30,40,50,60]

del a[1:3]

print(a)

This will give the output as :

[10,40,50,60]

11. Return every 2nd element in a list between 2 indices?

Ans) For returning every 2nd element in a list in between 2 indices, we can use step size parameter as follows:

a = [1,2,3,4,5,6,7,8,9]
a[0:5:2]
This will give us output as:
[1,3,5]

12. Get the first element from each nested list in a list?

Ans) Nested list is defined as a list inside another list.We can easily access first element of nested list by first iterating through nested list to get it's sub lists and then use slicing to access it's first element inside the for loop as shown below:

Example :

nest = [[1,2,3],[4,5,6],[7,8,9]]

For i in nest:
    print(i[0],end = " ")

Output: 1 4 7

13. How to modify elements of the list?

Ans) As list is a mutable data type thus we can add(by append or insert) or remove(by pop or remove or delete) elements from the list.We can also add list element by using list name alongwith index position in square brackets[] and assign new value to that position in list.

14. How to concatenate two lists?

Ans) The most conventional method to concatenate two lists is either by using + operator and concatenate both the string together Or we can also use extend to continue the two lists together.

15. How to add two lists element-wise in python?

Ans) For adding elements in two lists element-wise in python we can use zip function as follows:

```
a = [1,2,3]
b = [4,5,6]
s = []

for (item1,item2) in zip(a,b):
      s.append(item1+item2)
print(s)
```

16. Difference between del and clear?

Ans) To remove multiple elements without knowing their index, we can use Clear() method whereas del() function is used to permanently delete all the keys and values inside a dictionary.

Example:

```
a = {"b":20, "c":30, "d":40}
print(len(a))
a.clear()
print(len(a))
a.del()
a
```

Output:
2
0
NameError: name 'a' is not defined(as dictionary is already deleted using del() method)

17. Difference between remove and pop?

Ans) Remove() method is used to delete element whose value is given to us and pop() method is used when specific index of element that is to be deleted is given.

18. Difference between append and extend?

Ans) Append() method is used to add a single element to the list i.e. append() method only appends one new element to the end of the list. If you append a list to another list, the list that you append becomes a single element at the end of the first list **whereas** extend() method is used to add elements of another list to the otriginal list.

19. Difference between indexing and Slicing?

Ans) Indexing refers to accessing the value of a particular element at a time by it's index whereas Slicing means getting a subset of elements from the original list based on the indices given.

20. Difference between sort and sorted?

Ans) Sort is a python list method that sorts the original list whereas sorted function is an inbuilt function in python which creates a sorted copy of the original list and thus doesn't make any changes to original list.

21. Difference between reverse and reversed?

Ans) Reverse() function inverts the order of items in the given list. It doesn't create a new list object instead straightway modifies the original copy **whereas** reversed() function in Python allows us to process the items in a sequence in reverse order. It accepts a sequence and returns an iterator.

22. Difference between copy and deepcopy?

Ans) Shallow Copy stores the references of objects to the original memory address **whereas** deep copy stores copies of the object's value.

Shallow Copy reflects changes made to the new/copied object in the original object **whereas** deep copy doesn't reflect changes made to the new/copied object in the original object.

Shallow Copy stores the copy of the original object and points the references to the objects **whereas** deep copy stores the copy of the original object and recursively copies the objects as well.

23. How to remove duplicate elements in the list?

Ans) We can convert list to set data type to remove duplicated values present inside the list.

24. How to find an index of an element in the python list?

Ans) The index() method can be used to access the specific loaction i.e. to find index of element inside the list.

25. How to find the occurrences of an element in the python list?
Ans) Count() method can be used to find occurences of an element inside the python list. We can also use for loop and check for occurences of that particular element.

26. How to insert an item at a given position?

Ans) insert() method is used to insert a value at a given position in the list.

27. How to check if an item is in the list?

Ans) To check whether element is present inside a list or not, we can use "in" keyword which return bool value i.e. true if element exist inside the list and false if it doesn't exist. We can also iterate through the whole list using for loop and compare each element with given item to check whether it's present inside the list or not.

28. How to flatten a list in python?

Ans) A list of lists (2D list) can be flattened i.e. converted into 1-d
by itertools.chain.from_iterable() .It returns an iterator, so if you want to convert it
to a list, use list().
We can also use the in-built sum function in python to flatten a higher dimensional
list.

29. How to convert python list to other data structures like set, tuple, dictionary?

Ans) We use typecasting to convert a particular data structure to another data structure. Typecasting
to set can be done by using set(list), typecasting to tuple can be done by using tuple(list), typecasting
to dictionary can be done by using list comprehension and make a key:value pair of
consecutive elements. Finally, typecase the list to *dict* type.
We can also use zip() method to convert two lists into dictionary.

30. How to apply a function to all items in the list?

Ans) map() methods take two arguments: iterables and functions and returns a map
object. We use list() to convert the map object to a list.

We use a list comprehension to call a function on each element of the list and then
apply the given function to all elements of the list.

A lambda function can also be employed to apply the given function to all elements
of the list. Lambda is capable of creating an anonymous function that can be made
enough to apply the given function to all elements of the list.

31. How to filter the elements based on a function in a python list?

Ans) We can use filter function to filter the elements based on a function in a python
list. The filter() function iterates over the elements of the list and applies
the fn() function to each element. It returns an iterator for the elements where
the fn() returns True.

32. How python lists are stored in memory?

Ans) Python lists stores references ("pointers") to the objects that specifies address
of that particular element and then element is called using it's address. The list
object consists of two internal parts: one object header and one seperately allocated
array of object references.