

ASSIGNMENT - 2

LIST

1. **How do you add an element at the end of a list in Python?**

We use append() method

2. **How can you remove an element from a list by its index?**

We use pop(index) method to remove the element at the specified index

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

```
lst = [1, 2, 3, 4, 5]
lst[1:3] = [10, 20]
print(lst)
```

The output will be [1,10,20,4,5]

4. **How can you check if an element exists in a list in Python?**

Integrity operator "in"

eg: list = [1,2,3,4}
 print(3 in list) #True – because 3 exist in the list

5. **Write a Python function that removes duplicates from a list without using the set() function.**

```
remove_duplicates(list):
    unique_elements = []
    for i in list:
        if i in unique_elements:
            continue
        else:
            unique_elements.append(i)
    return unique_elements
```

TUPLE

6. **Can you modify the elements of a tuple after it has been created? Why or why not?**

No, because tuples are immutable meaning it cannot be modified after creation. Tuples are mainly used to store data safely thus it does not allow modification. It also takes up less memory than lists and can be used as keys in dictionary

7. **How would you access the second-to-last element in a tuple?**

We will use tuple unpacking

```
eg:         tuple = (1,2,3,4,5,6,7,8)
           a, *b = tuple
```

- a holds first element, *b holds the remaining second-to-last element as a list

8. **What is the difference between a list and a tuple in Python?**

- Tuples takes up less memory than lists
- Tuples are immutable whereas Lists are mutable
- Tuples can be used as keys in dictionary, List cannot

9. **Given the tuple t = (1, 2, 3, 4), how can you change the value 3 to 100?**

Convert the tuple into a list and then make changes and convert it back to a tuple

```
lst = list(t)
lst[2] = 100
t = tuple(lst)
```

10. **Write a Python function that takes a tuple of numbers and returns the sum of all its elements.**

```
from functools import reduce
def find_sum():
    print("Enter the numbers: ", end="")
    t = (int(x) for x in input().split())
    sum = reduce(lambda x,y: x+y, t)
    return sum
```

SET

11. **How do you remove all elements from a set in Python?**

`set.clear()`

12. **What is the output of the following code snippet?**

```
a = {1, 2, 3, 4}
b = {3, 4, 5, 6}
print(a - b)
```

`{1,2}`

13. **How do you check if an element is present in a set?**

Use integrity operator "in"

eg: `print(element in set)`

14. **Write a Python program to find the intersection of two sets.**

```
print(a & b)          #a and b are sets
```

15. **How does a set handle duplicate values when adding them?**

It ignores the value if it already exist in the set

DICTIONARY

16. **How can you add a new key-value pair to an existing dictionary in Python?**

```
dict[key] = value          # The value is stored by associating it with the key in
the dict
```

17. **What happens if you try to access a key that does not exist in a dictionary?**

It raises `KeyError`

18. **Write a Python function that takes a dictionary and returns a list of keys that have values greater than 50.**

```
def func(d):
    updated_d = dict(filter(lambda x:x[1]>50, d.items()))
    return updated_d
```

19. How would you iterate over both keys and values of a dictionary in Python?

```
for key, value in dict.items():
```

20. Write a Python function that merges two dictionaries.

```
def merge_dicts(a, b):  
    return {**a, **b}
```

MAP AND REDUCE

21. How does the map() function work in Python? Give an example where you square each number in a list.

Map function takes a function and a sequence of iterables to map each elements based on the function mentioned.

```
eg: square = list(map(lambda x:x**2 , nums))
```

22. What is the output of the following code?

```
from functools import reduce  
result = reduce(lambda x, y: x * y, [1, 2, 3, 4])  
print(result)
```

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23. How would you use the map() function to convert all string elements of a list to uppercase?

```
upper = list(map(lambda x:x.upper(), strings))
```

24. Write a Python program that uses reduce() to find the greatest common divisor (GCD) of a list of numbers.

```
def gcd(a,b):  
    while b:  
        a,b = b,a%b  
    return a
```

```
result = reduce(gcd, nums)
```

25. Compare and contrast the map() and filter() functions in Python

- Map function takes a function and a sequence as arguments and maps each element based on the condition mentioned in the function
- Filter function takes a function and a sequence as arguments and filters out the element that satisfy the condition mentioned in the function

LIST COMPREHENSION

26. Write a list comprehension that returns all even numbers from 0 to 20.

```
[x for x in range(0,21) if x%2==0]
```

27. How would you create a new list of squares from an existing list of numbers using list comprehension?

```
[x**2 for x in nums]
```

28. Write a list comprehension to extract all words that are longer than 4 characters from a sentence.

```
[x for x in sentence.split() if len(x)>4]
```

29. How can you use list comprehension to generate a list of the first 10 Fibonacci numbers?

```
def fibo(n):  
    if n < 2:  
        return n  
    a, b = 0, 1  
    for i in range(n-1):  
        a,b = b, a+b  
    return b  
print([fibo(x) for x in range(0,11)])
```

30. Can you use an if condition inside a list comprehension? Provide an example where only odd numbers are selected from a list.

Yes you can use if condition inside list comprehension

eg: [x for x in nums if x%2==1]