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BATCH = 80

Q1. Write a Python function to find the maximum and minimum numbers from a sequence of numbers.

```
def find_max_min(numbers):
    if len(numbers) == 0:
        return None, None

    maximum = numbers[0]
    minimum = numbers[0]

    for num in numbers:
        if num > maximum:
            maximum = num
        if num < minimum:
            minimum = num

    return maximum, minimum

nums = [10, 45, 3, 78, 22, 5]
max_value, min_value = find_max_min(nums)

print("Maximum:", max_value)
print("Minimum:", min_value)
```

Q2. Write a Python function that takes a positive integer and returns the sum of the cube of all the positive integers smaller than the specified number.

```
def sum_of_cubes(n):
    if n <= 0:
        return 0
    return sum(i**3 for i in range(1, n))

num = 5
result = sum_of_cubes(num)
print(f"Sum of cubes of numbers smaller than {num} is {result}")

Sum of cubes of numbers smaller than 5 is 100
```

Q3. Write a Python function to print 1 to n using recursion. (Note: Do not use loop)

```
def print_numbers(n, current=1):
    if current > n:
        return
    print(current, end=" ")
    print_numbers(n, current + 1)

n = 15
print_numbers(n)

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
```

Q4. Write a recursive function to print Fibonacci series upto n terms

```
def fibonacci(n):
    if n <= 0:
        return 0
    elif n == 1:
        return 0
    elif n == 2:
        return 1
    else:
        return fibonacci(n-1) + fibonacci(n-2)
```

```
def print_fibonacci_series(n):
    if n <= 0:
        print("Please enter a positive integer.")
    else:
        for i in range(1, n + 1):
            print(fibonacci(i), end=" ")

n = int(input("Enter number of terms: "))
print_fibonacci_series(n)

Enter number of terms: 7
0 1 1 2 3 5 8
```

Q5. Write a lambda function to find volume of cone.

```
import math
cone_volume = lambda r, h: (1/3) * math.pi * r**2 * h

radius = 4
height = 9
print(f"Volume of cone: {cone_volume(radius, height):.2f}")

Volume of cone: 150.80
```

Q6. Write a lambda function which gives tuple of max and min from a list. Sample input: [10, 6, 8, 90, 12, 56] Sample output: (90,6)

```
max_min = lambda lst: (max(lst), min(lst))

numbers = [10, 6, 8, 90, 12, 56]

result = max_min(numbers)
print(result)

(90, 6)
```

Q7. . Write functions to explain the mentioned concepts: a. Keyword argument b. Default argument c. Variable-length argument

```
def greet(name, age):
    print(f"Hello {name}, you are {age} years old.")

greet(age=25, name="Alice")

Hello Alice, you are 25 years old.
```

Q8. Write a program to check whether all the values in a dictionary are the same or not using a lambda function.

```
my_dict = {'a': 5, 'b': 5, 'c': 5}

all_values_same = lambda d: len(set(d.values())) == 1

print(all_values_same(my_dict))

my_dict2 = {'a': 5, 'b': 6, 'c': 5}
print(all_values_same(my_dict2))

True
False
```

Q9. Write a program to create two lists and generate a dictionary with keys from list1 and values from list2.

```
list1 = ['a', 'b', 'c', 'd']
list2 = [1, 2, 3, 4]

my_dict = dict(zip(list1, list2))
```

```
print(my_dict)  
{'a': 1, 'b': 2, 'c': 3, 'd': 4}
```

Git hub link = <https://github.com/pranavssinha11-glitch/Python.git>