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1. Write a Python function to find the factorial of a number using recursion. Description: The factorial of a number n is the product of all positive integers less than or equal to n. Example Input: 5 Example Output: 120

```
def factorial(n):
    if n < 0:
        raise ValueError("Factorial is not defined for negative
numbers.")
    elif n == 0 or n == 1:
        return 1
    else:
        return n * factorial(n - 1)

num = int(input("Enter a Number to Find the Factorial"))
print(f"The factorial of {num} is {factorial(num)}")
```

```
Enter a Number to Find the Factorial 5

The factorial of 5 is 120
```

1. Given two lists, write a Python function to find the intersection (common elements) of the lists. Description: The function should return a list of elements that appear in both input lists. Example Input: [1, 2, 3, 4] and [3, 4, 5, 6] Example Output: [3, 4]

```
def find_intersection(list1, list2):
    return list(set(list1) & set(list2))
list1 = [1,2,3,4]
list2 = [3,4,5,6]
print(f"The Common Elements in these List are :
{find_intersection(list1,list2)}")
```

```
The Common Elements in these List are : [3, 4]
```

1. Write a Python program to count the frequency of each element in a list. Description: Given a list of elements, return a dictionary where the keys are elements and the values are their frequencies. Example Input: [1, 2, 2, 3, 3, 3, 4] Example Output: {1: 1, 2: 2, 3: 3, 4: 1}

```
a = [1, 2, 2, 3, 3, 3, 4]
count_dict = {}
for i in a:
    if i not in count_dict:
        count_dict[i] = 1  # Initialize the count to 1
    else:
        count_dict[i] += 1  # Increment the count by 1

print(count_dict)
```

```
{1: 1, 2: 2, 3: 3, 4: 1}
```

1. Write a Python program to remove duplicates from a list while preserving the original order. Description: Given a list, return a new l/ist with all duplicate elements removed, keeping only the first occurrence of each element. Example Input: [1, 2, 2, 3, 4, 3] Example Output: [1, 2, 3, 4]

```
a = [1,2,2,3,4,3]
print(set(a))
```

```
{1, 2, 3, 4}
```

1. Write a Python function to calculate nCr (binomial coefficient) using the formula nCr=n!r!(n−r)!nCr = \frac{n!}{r!(n-r)!}nCr=r!(n−r)!n!. Description: Given integers n and r, calculate the value of nCr. o ExampleInput:n=5,r=3 Example Output: 10

```
Not able to Solve this One ! Please If Someone Understood The Solution Share 
```

1. Write a Python function that takes a string as input and returns the string reversed. Example Input: "hello" Example Output: "olleh"

```
value = input("Enter String to Reverse It :")
print(value[::-1])
```

```
Enter String to Reverse It : Aditya
```

```
aytidA
```

1. Write a Python program to check if a given year is a leap year or not. Description: A year is a leap year if it is divisible by 4, except for years that are divisible by 100, unless they are also divisible by 400. Example Input: 2020 Example Output: True

```
yr = int(input("Enter a year: "))

if yr % 400 == 0:
    print("Leap year")
elif yr % 100 == 0:
    print("Not a Leap Year")
elif yr % 4 == 0:
    print("Leap year")
else:
    print("Not a Leap Year")
```

```
Enter a year:  1900
```

```
Not a Leap Year
```

1. Write a Python function to count the number of vowels in a given string. Example Input: "hello world" Example Output: 3

```
value = input("Enter a String")
value = value.lower()
final = ""
```

```
for i in range(len(value)) :
    if value[i] == "a" or value[i] == "e" or value[i] == "i" or
value[i] == "o" or value[i] == "u"  :
        final = final + value[i]
print(len(final))
```

```
Enter a String Aditya

3
```

1. Write a Python function that takes a list of integers and returns a tuple containing the maximum and minimum values from the list. Example Input: [1, 2, 3, 4, 5] Example Output: (5, 1)

```
value = [1,2,3,4,5]
mx = max(value)
mi = min(value)
print(tuple([mx,mi]))
```

```
(5, 1)
```

1. Write a Python function that takes a list of integers and returns the sum of all the even numbers in the list. Example Input: [1, 2, 3, 4, 5] Example Output: 6

```
a = int(input("Enter an integer value for the range: "))
myList = [i for i in range(a + 1) if i % 2 == 0]
print("Sum of even numbers:", sum(myList))
```

```
Enter an integer value for the range:  5

Sum of even numbers: 6
```

1. Write a Python function that takes a list of integers and returns the second largest element in the list. If there is no second largest, return None. Example Input: [1, 2, 3, 4, 5] Example Output: 4 Example Input: [5, 5, 5] Example Output: None

```
def second_largest(lst):
    unique_lst = sorted(set(lst), reverse=True)
    if len(unique_lst) < 2:
        return None
    else:
        return unique_lst[1]
count = 5
l = []
for i in range(count):
    value = input("Enter Digit")
    l.append(value)
print("The Second Largest Element is : " + second_largest(l))
```

```
Enter Digit 1
Enter Digit 2
```

```
Enter Digit 3
Enter Digit 4
Enter Digit 5

The Second Largest Element is : 4
```

1. Write a Python function that removes all whitespace characters (spaces, tabs, etc.) from as string. Example Input: "hello world" Example Output: helloworld|

```
def remove_whitespace(input_string):
    return ''.join(input_string.split())

input_string = input("Enter a String")
print(f"{remove_whitespace(input_string)}")

Enter a String Aditya   Kanoi.          DataScience

AdityaKanoi.DataScience
```

1. Write a Python function that takes a string and returns the length of the longest word in the string. Example Input: "The quick brown fox" Example Output: 5

```
string = input("Enter a Sentence: ")
l = string.split()
l.sort(key=len)
print(len(l[-1]))

Enter a Sentence:  The quick brown fox

5
```

1. Write a Python function that prints the multiplication table for a given number from 1 to 10. Example Input: 3 Example Output: 3 x 1 = 3 3 x 2 = 6 3 x 3 = 9 ... 3 x 10 = 30

```
value = int(input("Enter Value to Get Table : "))
for i in range(11) :
    print(f"{value} X {i} = {value*i}")

Enter Value to Get Table :  3

3 X 0 = 0
3 X 1 = 3
3 X 2 = 6
3 X 3 = 9
3 X 4 = 12
3 X 5 = 15
3 X 6 = 18
3 X 7 = 21
3 X 8 = 24
3 X 9 = 27
3 X 10 = 30
```

1. Write a Python function that prints all prime numbers between start and end (inclusive). Example Input: 10, 20 Example Output: 11, 13, 17, 19

```
start = int(input("Enter Start Digit"))
end = int(input("Enter End Digit"))
myList = [i for i in range(start,end+1)]
print(myList)
```

```
Enter Start Digit 1
Enter End Digit 10
```

```
[1, 2, 3, 4, 5, 6, 7, 8, 9, 10]
```

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