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INSTITUTE OF ARTIFICIAL INTELLIGENCE AND DATA SCIENCE
DEPRATMENT OF DATA SCIENCE

Course code/Name: CSA08/ Python Programming

1. Find the Mth maximum number and Nth minimum number in list and then find the sum of it and difference of it.

Sample Input:
list of elements = [14, 16, 87, 36, 25, 89, 34]
M = 1
N = 3
Sample Output:
1st Maximum Number = 89
3rd Minimum Number = 25
Sum = 114
Difference = 64

Test cases:
1. [16, 16, 16 16, 16], M = 0, N = 1
2. [0, 0, 0, 0], M = 1, N = 2
3. [-12, -78, -35, -42, -85], M = 3 , N = 3
4. [15, 19, 34, 56, 12], M = 6 , N = 3
5. [85, 45, 65, 75, 95], M = 5 , N = 7

2. Write a program to read a character until a * is encountered. Also count the number of uppercase, lowercase, and numbers entered by the users.

Sample Input:
Enter * to exit…
Enter any character: W
Enter any character: d
Enter any character: A
Enter any character: G
Enter any character: g
Enter any character: H
Enter any character: *
Sample Output:
Total count of lower case:2
Total count of upper case:4
Total count of numbers =0
Test cases:
1. 1,7,6,9,5
2. S, Q, l, K,7, j, M

3. M, j, L, &, @, G
4. D, K, I, 6, L, *
5. *, K, A, e, 1, 8, %, *

3. Write a program to read the numbers until -1 is encountered. Find the average of positive numbers and negative numbers entered by user.

Sample Input:

Enter -1 to exit…
Enter the number: 7
Enter the number: -2
Enter the number: 9
Enter the number: -8
Enter the number: -6
Enter the number: -4
Enter the number: 10
Enter the number: -1

Sample Output:

The average of negative numbers is: -5.0
The average of positive numbers is : 8.66666667

Test cases:

1. -1,43, -87, -29, 1, -9
2. 73, 7-6,2,10,28,-1
3. -5, -9, -46,2,5,0
4. 9, 11, -5, 6, 0,-1
5. -1,-1,-1,-1,-1

4. Raju, has again started troubling people in your city. The people have turned on to you for getting rid of Raju. Raju presents to you a number consisting of numbers from 0 to 9 characters. He wants you to reverse it from the final answer such that the number becomes Mirror number. A Mirror is a number which equals its reverse. The hope of people are on you so you have to solve the riddle. You have to tell if some number exists which you would reverse to convert the number into Mirror

Sample input:

Enter the number: 123456

Sample output:

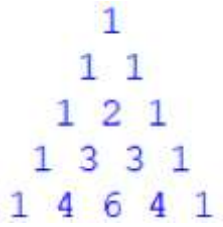
Mirror image: 654321

Test cases:

1. Sell123
2. 5489236
3. Abc-abc
4. %$$$$^&
5. -123456

5. Implement a triangular array of the binomial coefficients that arises in probability theory, combinatorics, and algebra. Find the sum of elements in the nth row.

Sample Input:
Enter the number of rows: 5
Enter the row number: 4
Sample Output:



Sum of elements in 4th row: 8

Test Cases:
1.0, -1
2. 7,5
3. -1,5
4. 9, -5
5. 10, 8

6.An online retailer provides express shipping for many of its items at a rate of 750 for the first item, and 200 for each subsequent item. Write a function that takes the number of items in the order as its only parameter. Return the shipping charge for the order as the functions result. Include the code that reads the number of items purchased from the user and displays the shipping charge. All float values are displayed correct to 2 decimal places.
Sample Input
10
Sample Output
2550
Test Cases:

1. 45
2. -12
3. 12
4. 0
5. 56

7. Write a python function called matches that takes two strings as arguments and returns how many matches there are between the strings. A match is where the two strings have the same character at the same index.
Test Cases:
1. Input: s1= “what” s2= “watch”
Output: 1
2.Input: s1= “ ran” s2= “van”
3. Input : s1 = “ rain” s2 = “ turn”
4.Input : s1 = “ python” s2 = “py”
5. Inpput: s1= “man” s2= “women”

8. Write a python program to print the factorial of n and number of factors for n?
Sample input:

N=6
Sample output:
6 Factorial: 720
Number of factors for 6: 4
Test cases:

1. N=0
2. N=-5
3. N=1
4. N=20
5. N=3A

9. Write a python program to Print the pattern:
Sample Input:
Enter the starting number: 1.4
Max number of line printed: 3
Sample output:
1.4
1.5 1.6
1.7 1.8 1.9
Test Cases:

1) 5.6, 4
2) 0.8, -1
3) 1.9, 0
4) 3.4, 5
5) 7.8 3

10. Write a python program to print the first n perfect numbers and its first m factors.
Sample Input:
N=3, M=4
Sample Output:
First 4 factors of 6 are: 1,2,3,6
First 4 Factors of 28 are: 1,2,4,7
First 4 Factors of 496 are: 1,2,4,8
Test Cases:

1. N=0, M=3
2. N=4, M=4
3. N=12, M=3
4. N=-5, M=3
5. N=0.2, M=-4