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NeoColab_REC_CS23221_Python Programming

REC_Python_Week 1_COD

Attempt : 1
Total Mark : 5
Marks Obtained : 4

Section 1 : Coding

1. Problem Statement

Quentin, a mathematics enthusiast, is exploring the properties of numbers. He believes that for any set of four consecutive integers, calculating the average of their fourth powers and then subtracting the product of the first and last numbers yields a constant value.

To validate his hypothesis, check if the result is indeed constant and display.

Example:

Input:

5

Output:

Constant value: 2064.5

Explanation:

Find the Average:

Average: (625 + 1296 + 2401 + 4096)/4 = 2104.5

Now, we calculate the product of a and (a + 3):

Product = 5 × (5 + 3) = 5 × 8 = 40

Final result: 2104.5 - 40 = 2064.5

Input Format

The input consists of an integer a, representing the first of four consecutive integers.

Output Format

The output displays "Constant value: " followed by the computed result based on Quentin's formula.

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 5
Output: Constant value: 2064.5

Answer

```
a=int(input(""))
b=(a+1)**4
c=(a+2)**4
d=(a+3)**4
e=a**4
avg=float((b+c+d+e)/4)
pro=a*(a+3)
r=avg-pro
print("constant value:",r)
```

Status : Correct *Marks : 1/1*

2. Problem Statement

A company has hired two employees, Alice and Bob. The company wants to swap the salaries of both employees. Alice's salary is an integer value and Bob's salary is a floating-point value.

Write a program to swap their salaries and print the new salary of each employee.

Input Format

The first line of input consists of an integer N, representing Alice's salary.

The second line consists of a float value F, representing Bob's salary.

Output Format

The first line of output displays "Initial salaries:"

The second line displays "Alice's salary = N", where N is Alice's salary.

The third line of output displays "Bob's salary = F", where F is Bob's salary.

After a new line space, the following line displays "New salaries after swapping:"

The next line displays "Alice's salary = X", where X is the swapped salary.

The last line displays "Bob's salary = Y", where Y is the swapped salary.

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 10000
15400.55
Output: Initial salaries:
Alice's salary = 10000

Bob's salary = 15400.55

New salaries after swapping:
Alice's salary = 15400.55
Bob's salary = 10000

Answer

```
a=int(input(""))
b=b=float(input(""))
print("Initial salaries:")
print("Alice's salary=",a)
print("Bob's salary=",b)
print("New salaries after swapping:")
print("Alice's salary=",b)
print("Bob's salary=",a)
```

Status : Correct ***Marks : 1/1***

3. Problem Statement

A science experiment produces a decimal value as the result. However, the scientist needs to convert this value into an integer so that it can be used in further calculations.

Write a Python program that takes a floating-point number as input and converts it into an integer.

Input Format

The input consists of a floating point number, F.

Output Format

The output prints "The integer value of F is: {result}", followed by the integer number equivalent to the floating point number.

Refer to the sample output for the formatting specifications.

Sample Test Case

Input: 10.36
Output: The integer value of 10.36 is: 10

Answer

```
a=float(input(""))
b=int(a)
print("The integer value of",a,"is:",b)
```

Status : Correct ***Marks : 1/1***

4. Problem Statement

Bob, the owner of a popular bakery, wants to create a special offer code for his customers. To generate the code, he plans to combine the day of the month with the number of items left in stock.

Help Bob to encode these two values into a unique offer code.

Note: Use the bitwise operator to calculate the offer code.

Example

Input:

15

9

Output:

Offer code: 6

Explanation:

Given the day of the month 15th day (binary 1111) and there are 9 items left (binary 1001), the offer code is calculated as 0110 which is 6.

Input Format

The first line of input consists of an integer D, representing the day of the month.

The second line consists of an integer S, representing the number of items left in stock.

Output Format

The output displays "Offer code: " followed by an integer representing the encoded offer code.

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 15
9
Output: Offer code: 6

Answer

```
a=int(input(""))
b=int(input(""))
print("offer code:",a^b)
```

Status : Correct ***Marks : 1/1***

5. Problem Statement

In a family, two children receive allowances based on the gardening tasks they complete. The older child receives an allowance rate of Rs.5 for each task, with a base allowance of Rs.50. The younger child receives an allowance rate of Rs.3 for each task, with a base allowance of Rs.30.

Your task is to calculate and display the allowances for the older and younger children based on the number of gardening tasks they complete, along with the total allowance for both children combined.

Input Format

The first line of input consists of an integer n, representing the number of chores completed by the older child.

The second line consists of an integer m, representing the number of chores completed by the youngest child.

Output Format

The first line of output displays "Older child allowance: Rs." followed by an integer representing the allowance calculated for the older sibling.

The second line displays "Younger child allowance: Rs." followed by an integer representing the allowance calculated for the youngest sibling.

The third line displays "Total allowance: Rs." followed by an integer representing the sum of both siblings' allowances.

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 10
5
Output: Older child allowance: Rs.100
Younger child allowance: Rs.45
Total allowance: Rs.145

Answer

```
def calculate_allowance(n,m):
    older=50+(5*n)
    younger=30+(3*m)
    total=older+younger
    print(f"0lder child allowance:Rs.{older}")
    print(f"Younger child allowance:Rs.{younger}")
    print(f"Total allowance:Rs.{total}")
n=int(input())
m=int(input())
calculate_allowance(n,m)
```

Status : Wrong ***Marks : 0/1***

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NeoColab_REC_CS23231_DATA STRUCTURES

REC_DS using C_Week 6_CY_Updated

Attempt : 1
Total Mark : 30
Marks Obtained : 30

Section 1 : Coding

1. Problem Statement

Sheela wants to distribute cookies to her children, but each child will only be happy if the cookie size meets or exceeds their individual greed factor. She has a limited number of cookies and wants to make as many children happy as possible. Priya decides to sort both the greed factors and cookie sizes using QuickSort to efficiently match cookies with children. Your task is to help Sheela determine the maximum number of children that can be made happy.

Input Format

The first line of input consists of an integer n, representing the number of children.

The second line contains n space-separated integers, where each integer represents the greed factor of a child.

The third line contains an integer m, representing the number of cookies.

The fourth line contains m space-separated integers, where each integer represents the size of a cookie.

Output Format

The output prints a single integer, representing the maximum number of children that can be made happy.

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 3
1 2 3
2
1 1
Output: The child with greed factor: 1

Answer

```
#include <stdio.h>

// QuickSort partition function (ascending order)
int partition(int arr[], int low, int high) {
    int pivot = arr[high];
    int i = low - 1;
    for (int j = low; j < high; j++) {
        if (arr[j] <= pivot) {
            i++;
            // Swap arr[i] and arr[j]
            int temp = arr[i];
            arr[i] = arr[j];
            arr[j] = temp;
        }
    }
    // Swap arr[i+1] and arr[high] (pivot)
    int temp = arr[i+1];
    arr[i+1] = arr[high];
    arr[high] = temp;
```

```
    return i + 1;
}

// QuickSort function
void quickSort(int arr[], int low, int high) {
    if (low < high) {
        int pi = partition(arr, low, high);

        quickSort(arr, low, pi -1);
        quickSort(arr, pi + 1, high);
    }
}

int main() {
    int n, m;
    scanf("%d", &n);
    int greed[100];
    for (int i = 0; i < n; i++)
        scanf("%d", &greed[i]);

    scanf("%d", &m);
    int cookies[100];
    for (int i = 0; i < m; i++)
        scanf("%d", &cookies[i]);

    // Sort greed factors and cookie sizes
    quickSort(greed, 0, n - 1);
    quickSort(cookies, 0, m - 1);

    int childIndex = 0, cookieIndex = 0, happyCount = 0;

    // Match cookies to children
    while (childIndex < n && cookieIndex < m) {
        if (cookies[cookieIndex] >= greed[childIndex]) {
            happyCount++;
            childIndex++;
            cookieIndex++;
        } else {
            cookieIndex++;
        }
    }
```

```
    printf("The child with greed factor: %d\n", happyCount);

    return 0;
}
// You are using GCC
```

Status : Correct ***Marks : 10/10***

2. Problem Statement

Aryan is participating in a coding competition where he needs to sort a list of numbers using an efficient sorting algorithm. He decides to use Merge Sort, a divide-and-conquer algorithm, to achieve this. Given a list of n elements, Aryan must implement merge sort to arrange the numbers in ascending order.

Help Aryan by implementing the merge sort algorithm to correctly sort the given list of numbers.

Input Format

The first line of input contains an integer n, the number of elements in the list.

The second line contains n space-separated integers representing the elements of the list.

Output Format

The output prints the sorted list of numbers in ascending order, separated by a space.

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 5
80 40 20 50 30
Output: 20 30 40 50 80

Answer

```c
#include <stdio.h>

// Merge two sorted subarrays arr[l..m] and arr[m+1..r]
void merge(int arr[], int l, int m, int r) {
    int n1 = m - l + 1;
    int n2 = r - m;

    int left[n1], right[n2];

    // Copy data to temp arrays
    for (int i = 0; i < n1; i++)
        left[i] = arr[l + i];
    for (int j = 0; j < n2; j++)
        right[j] = arr[m + 1 + j];

    int i = 0, j = 0, k = l;

    // Merge back into arr[]
    while (i < n1 && j < n2) {
        if (left[i] <= right[j])
            arr[k++] = left[i++];
        else
            arr[k++] = right[j++];
    }

    // Copy any remaining elements of left[]
    while (i < n1)
        arr[k++] = left[i++];

    // Copy any remaining elements of right[]
    while (j < n2)
        arr[k++] = right[j++];
}

// Recursive merge sort function
void mergeSort(int arr[], int l, int r) {
    if (l < r) {
        int m = l + (r - l) / 2;

        mergeSort(arr, l, m);
        mergeSort(arr, m + 1, r);
```

```
        merge(arr, l, m, r);
    }
}

int main() {
    int n;
    scanf("%d", &n);

    int arr[50];
    for (int i = 0; i < n; i++)
        scanf("%d", &arr[i]);

    mergeSort(arr, 0, n - 1);

    for (int i = 0; i < n; i++)
        printf("%d ", arr[i]);
    printf("\n");

    return 0;
}
```

Status : Correct **Marks : 10/10**

3. Problem Statement

Ravi is given an array of integers and is tasked with sorting it in a unique way. He needs to sort the elements in such a way that the elements at odd positions are in descending order, and the elements at even positions are in ascending order. Ravi decided to use the Insertion Sort algorithm for this task.

Your task is to help ravi, to create even_odd_insertion_sort function to sort the array as per the specified conditions and then print the sorted array.

Example

Input:

10

25 36 96 58 74 14 35 15 75 95

Output:

96 14 75 15 74 36 35 58 25 95

Input Format

The first line of input consists of a single integer, N, which represents the size of the array.

The second line contains N space-separated integers, representing the elements of the array.

Output Format

The output displays the sorted array using the even-odd insertion sort algorithm and prints the sorted array.

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 4
3 1 4 2

Output: 4 1 3 2

Answer

```
#include <stdio.h>

void even_odd_insertion_sort(int arr[], int n) {
    // Sort odd positions (1-based) in descending order
    // Odd positions correspond to 0,2,4,... in 0-based indexing
    for (int i = 2; i < n; i += 2) {
        int key = arr[i];
        int j = i - 2;
        // Descending order for odd positions
        while (j >= 0 && arr[j] < key) {
            arr[j + 2] = arr[j];
            j -= 2;
        }
        arr[j + 2] = key;
    }
```

```
    // Sort even positions (1-based) in ascending order
    // Even positions correspond to 1,3,5,... in 0-based indexing
    for (int i = 3; i < n; i += 2) {
        int key = arr[i];
        int j = i - 2;
        // Ascending order for even positions
        while (j >= 1 && arr[j] > key) {
            arr[j + 2] = arr[j];
            j -= 2;
        }
        arr[j + 2] = key;
    }
}

int main() {
    int n;
    scanf("%d", &n);
    int arr[10];  // Constraint: N ≤ 10

    for (int i = 0; i < n; i++)
        scanf("%d", &arr[i]);

    even_odd_insertion_sort(arr, n);

    for (int i = 0; i < n; i++)
        printf("%d ", arr[i]);
    printf("\n");

    return 0;
}
```

Status : Correct ***Marks : 10/10***

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NeoColab_REC_CS23231_DATA STRUCTURES

REC_DS using C_Week 0_Arrays and Functions

Attempt : 1
Total Mark : 5
Marks Obtained : 0.85

Section 1 : Coding

1. Problem Statement

Saurabh is the manager of a growing tech company. He needs a program to record and analyze the monthly salaries of his employees. The program will take the number of employees and their respective salaries as input and then calculate the average salary, and find the highest and lowest salary among them.

Help Saurabh automate this task efficiently.

Input Format

The first line of input consists of an integer n, representing the number of employees.

The second line consists of n integers, where each integer represents the salary of an employee.

Output Format

The output prints n lines, where each line will display: "Employee i: "Salary

Where i is the employee number (starting from 1) and salary is the respective salary of that employee.

After that, print the average salary in the following format: "Average Salary: "average_salary

Where average_salary is the average salary of all employees, rounded to two decimal places.

Next, print the highest salary in the following format: "Highest Salary: "max_salary

Where max_salary is the highest salary among all employees.

Finally, print the lowest salary in the following format:"Lowest Salary: "min_salary

Where min_salary is the lowest salary among all employees.

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 5
4000
3500
6000
2500

4500

Output: Employee 1: 4000
Employee 2: 3500
Employee 3: 6000
Employee 4: 2500
Employee 5: 4500

Average Salary: 4100.00
Highest Salary: 6000
Lowest Salary: 2500

Answer

```
#include<stdio.h>
int main(){
    int n,min=0,max=0,sum=0;
    float average=0;

    scanf("%d",&n);
    int salary[n];
    for(int i=0;i<n;i++){
        scanf("%d",&salary[i]);
    }
    min=salary[0],max=salary[0];
    for(int i=0;i<n;i++){
        sum=sum+salary[i];
        if(max<salary[i]){
            max=salary[i];
        }
        if(min>salary[i]){
            min=salary[i];
        }
    }
    average=sum/n;
    for(int i=0;i<n;i++){
        printf("Employee %d: %d\n",i+1,salary[i]);
    }
    printf("Average Salary:%.2f \n",average);
        printf("highest Salary:%d \n",max);
            printf("lowest Salary:%d\n",min);
}
```

Status : Partially correct ***Marks : 0.85/1***

2. Problem Statement

Tim is creating a program to track and analyze student attendance. The program requires two inputs: the total number of students (n) and the total number of class sessions (m). The task is to design and populate an attendance matrix, 'matrix', representing the attendance record of each student for each session.

The program's specific objective is to determine whether the last student on the list attended an even or odd number of classes. This functionality will aid teachers in quickly evaluating the attendance habits of individual students.

Input Format

The first line of input consists of a positive integer n, representing the number of students.

The second line consists of a positive integer m, representing the number of class sessions.

The next n lines consist of m space-separated positive integers representing the number of classes attended by the student.

Output Format

The output displays one of the following results:

If the last session is even the output prints "[LastSession] is even".

If the last session is odd the output prints "[LastSession] is odd".

Refer to the sample output for the formatting specifications.

Sample Test Case

Input: 2
2
1 2
3 100

Output: 100 is even

Answer

-

Status : -

Marks : 0/1

3. Problem Statement

Write a program that reads an integer 'n' and a square matrix of size 'n x n' from the user. The program should then set all the elements in the lower triangular part of the matrix (including the main diagonal) to zero using a function and display the resulting matrix.

Function Signature: void setZeros(int [ ][ ], int)

Input Format

The first line consists of an integer M representing the number of rows & columns.

The next M lines consist of M space-separated integers in each line representing the elements of the matrix.

Output Format

The output displays the matrix containing M space-separated elements in M lines where the lower triangular elements are replaced with zero.

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 3
10 20 30
40 50 60
70 80 90
Output: 0 20 30
0 0 60
0 0 0

Answer

-

Status : -

Marks : 0/1

4. Problem Statement

Write a program that will read a Matrix (two-dimensional arrays) and print the sum of all elements of each row by passing the matrix to a function.

Function Signature: void calculateRowSum(int [ ][ ], int, int)

Input Format

The first line consists of an integer M representing the number of rows.

The second line consists of an integer N representing the number of columns.

The next M lines consist of N space-separated integers in each line representing the elements of the matrix.

Output Format

The output displays the sum of all elements of each row separated by a space.

Refer to the sample output for the formatting specifications.

Sample Test Case

Input: 3
3
1 2 3
4 5 6
7 8 9
Output: 6 15 24

Answer

-

Status : -

Marks : 0/1

5. Problem Statement

Alex, a budding programmer, is tasked with writing a menu-driven program to perform operations on an array of integers. The operations include finding the smallest number, the largest number, the sum of all numbers, and their average. The program must repeatedly display the menu until Alex chooses to exit.

Write a program to ensure the specified tasks are implemented based on Alex's choices.

Input Format

The first line contains an integer n, representing the number of elements in the array.

The second line contains n space-separated integers representing the array elements.

The subsequent lines contain integers representing the menu choices:

Choice 1: Find and display the smallest number.

Choice 2: Find and display the largest number.

Choice 3: Calculate and display the sum of all numbers.

Choice 4: Calculate and display the average of all numbers as double.

Choice 5: Exit the program.

Output Format

For each valid menu choice, print the corresponding result:

For choice 1, print "The smallest number is: X", where X is the smallest number in the array.

For choice 2, print "The largest number is: X", where X is the largest number in the array.

For choice 3, print "The sum of the numbers is: X", where X is the sum of all numbers in the array.

For choice 4, print "The average of the numbers is: X. XX", where X.XX is the double value representing an average of all numbers in the array, rounded to two decimal places.

For choice 5, print "Exiting the program".

If an invalid choice is made, print "Invalid choice! Please enter a valid option (1-5)."

Refer to the sample output for the formatting specifications.

Sample Test Case

Input: 3
10 20 30
1
5
Output: The smallest number is: 10
Exiting the program

Answer

-

Status : -

Marks : 0/1

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NeoColab_REC_CS23221_Python Programming

REC_Python_Week 1_MCQ

Attempt : 1
Total Mark : 15
Marks Obtained : 12

Section 1 : MCQ

1. What is the output of the following number conversion?

```
z = complex(1.25)
print(z)
```

Answer

(1.25+0j)

Status : Correct ***Marks : 1/1***

2. Which of the following can convert the string to a float number?

Answer

float(str)

Status : Correct ***Marks : 1/1***

3. What is the return type of the function id?

Answer

int

Status : Correct ***Marks : 1/1***

4. Which of the following functions converts a string to a float in Python?

Answer

str(x)

Status : Wrong ***Marks : 0/1***

5. Which of the following is an example of the type casting?

Answer

float(5)

Status : Wrong ***Marks : 0/1***

6. Which of the following operators has its associativity from right to left?

Answer

**

Status : Correct ***Marks : 1/1***

7. Which is the correct operator for power(xy)?

Answer

x**y

Status : Correct ***Marks : 1/1***

8. Evaluate the expression given below if A= 16 and B = 15

A % B // A

Answer

0

Status : Correct ***Marks : 1/1***

9. The value of the expressions 4/(3*(2-1)) and 4/3*(2-1) is the same. True or False?

Answer

True

Status : Correct ***Marks : 1/1***

10. What will the following code output?

```
z = 3 + 4j
print(abs(z))
```

Answer

5.0

Status : Correct ***Marks : 1/1***

11. What will be the value of the following Python expression?

4 + 3 % 5

Answer

7

Status : Correct ***Marks : 1/1***

12. What will be the output of the following code?

```
x = int(34.56 - 2 * 2)
print(x)
```

Answer

30

Status : Correct ***Marks : 1/1***

13. What does 3 ^ 4 evaluate to?

Answer

81

Status : Wrong ***Marks : 0/1***

14. What will be the output for the below code?

```
x=15
y=12
print(x&y)
```

Answer

12

Status : Correct ***Marks : 1/1***

15. What is typecasting in Python?

Answer

Change data type property

Status : Correct ***Marks : 1/1***

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NeoColab_REC_CS23221_Python Programming

REC_Python_Week 2_COD_Updated

Attempt : 1
Total Mark : 50
Marks Obtained : 0

Section 1 : Coding

1. Problem Statement

As a junior developer working on a text analysis project, your task is to create a program that displays the consonants in a sentence provided by the user, separated by spaces.

You need to implement a program that takes a sentence as input and prints the consonants while skipping vowels and non-alphabetic characters using only control statements.

Input Format

The input consists of a string representing the sentence.

Output Format

The output displays space-separated consonants present in the sentence.

Refer to the sample output for the formatting specifications.

Sample Test Case

Input: Hello World!
Output: H l l W r l d

Answer

-

Status : Skipped ***Marks : 0/10***

2. Problem Statement

You work as an instructor at a math enrichment program, and your goal is to develop a program that showcases the concept of using control statements to manipulate loops. Your task is to create a program that takes an integer 'n' as input and prints the squares of even numbers from 1 to 'n', while skipping odd numbers.

Input Format

The input consists of a single integer, which represents the upper limit of the range.

Output Format

The output displays the square of even numbers from 1 to 'n' separated by lines.

Refer to the sample output for the formatting specifications.

Sample Test Case

Input: 10
Output: 4
16
36

64
100

Answer

-

Status : *-* ***Marks : 0/10***

3. Problem Statement

Emma, a mathematics enthusiast, is exploring a range of numbers and wants to count how many of them are not Fibonacci numbers.

Help Emma determine the count of non-Fibonacci numbers within the given range [start, end] using the continue statement.

Input Format

The first line of input consists of an integer, representing the starting number of the range.

The second line consists of an integer, representing the ending number of the range.

Output Format

The output prints a single integer, representing the count of numbers in the range that are not Fibonacci numbers.

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 1
10
Output: 5

Answer

-

Status : *-* ***Marks : 0/10***

4. Problem Statement

Ethan, a curious mathematician, is fascinated by perfect numbers. A perfect number is a number that equals the sum of its proper divisors (excluding itself). Ethan wants to identify all perfect numbers within a given range.

Help him write a program to list these numbers.

Input Format

The first line of input consists of an integer start, representing the starting number of the range.

The second line consists of an integer end, representing the ending number of the range.

Output Format

The output prints all perfect numbers in the range, separated by a space.

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 1
100
Output: 6 28

Answer

-

Status : -

Marks : 0/10

5. Problem Statement

John, a software developer, is analyzing a sequence of numbers within a given range to calculate their digit sum. However, to simplify his task, he excludes all numbers that are palindromes (numbers that read the same

backward as forward).

Help John find the total sum of the digits of non-palindromic numbers in the range [start, end] (both inclusive).

Example:

Input:

10

20

Output:

55

Explanation:

Range [10, 20]: Non-palindromic numbers are 10, 12, 13, 14, 15, 16, 17, 18, 19 and 20.

Digit sums: 1+0 + 1+2 + 1+3 + 1+4 + 1+5 + 1+6 + 1+7 + 1+8 + 1+9 + 2+0 = 55.

Output: 55

Input Format

The first line of input consists of an integer, representing the starting number of the range.

The second line of input consists of an integer, representing the ending number of the range.

Output Format

The output prints a single integer, representing the total sum of the digits of all non-palindromic numbers in the range.

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 10
20
Output: 55

Answer

-

Status : *-* ***Marks : 0/10***

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NeoColab_REC_CS23221_Python Programming

REC_Python_Week 3_COD

Attempt : 1
Total Mark : 50
Marks Obtained : 30

Section 1 : Coding

1. Problem Statement

Given a list of positive and negative numbers, arrange them such that all negative integers appear before all the positive integers in the array. The order of appearance should be maintained.

Example

Input:

[12, 11, -13, -5, 6, -7, 5, -3, -6]

Output:

List = [-13, -5, -7, -3, -6, 12, 11, 6, 5]

Explanation:

The output is the arranged list where all the negative integers appear before the positive integers while maintaining the original order of appearance.

Input Format

The input consists of a single line containing a list of integers enclosed in square brackets separated by commas.

Output Format

The output displays "List = " followed by an arranged list of integers as required, separated by commas and enclosed in square brackets.

Refer to the sample output for the formatting specifications.

Sample Test Case

Input: [12, 11, -13, -5, 6, -7, 5, -3, -6]
Output: List = [-13, -5, -7, -3, -6, 12, 11, 6, 5]

Answer

-

Status : Skipped ***Marks : 0/10***

2. Problem Statement

Alex is working on a Python program to manage a list of elements. He needs to append multiple elements to the list and then remove an element from the list at a specified index.

Your task is to create a program that helps Alex manage the list. The program should allow Alex to input a list of elements, append them to the existing list, and then remove an element at a specified index.

Input Format

The first line contains an integer n, representing the number of elements to be appended to the list.

The next n lines contain integers, representing the elements to be appended to the list.

The third line of input consists of an integer M, representing the index of the element to be popped from the list.

Output Format

The first line of output displays the original list.

The second line of output displays the list after popping the element of the index M.

The third line of output displays the popped element.

Refer to the sample output for the formatting specifications.

Sample Test Case

Input: 5
64
98
-1
5
26
3
Output: List after appending elements: [64, 98, -1, 5, 26]
List after popping last element: [64, 98, -1, 26]
Popped element: 5

Answer

-

Status : Skipped ***Marks : 0/10***

3. Problem Statement

Ram is working on a program to manipulate strings. He wants to create a program that takes two strings as input, reverses the second string, and

then concatenates it with the first string.

Ram needs your help to design a program.

Input Format

The input consists of two strings in separate lines.

Output Format

The output displays a single line containing the concatenated string of the first string and the reversed second string.

Refer to the sample output for the formatting specifications.

Sample Test Case

Input: hello
word
Output: hellodrow

Answer

```
str1=input()
str2=input()
rev_str2=" "
for i in range(len(str2)-1,-1,-1):
    rev_str2+=str2[i]
result=str1+rev_str2
print(result)
```

Status : Correct ***Marks : 10/10***

4. Problem Statement

You have a string containing a phone number in the format "(XXX) XXX-XXXX". You need to extract the area code from the phone number and create a new string that contains only the area code.

Write a Python program for the same.

Note

(XXX) - Area code

XXX-XXXX - Phone number

Input Format

The input consists of a string, representing the phone number in the format "(XXX) XXX-XXXX".

Output Format

The output displays "Area code: " followed by a string representing the area code for the given phone number.

Refer to the sample output for the formatting specifications.

Sample Test Case

Input: (123) 456-7890
Output: Area code: 123

Answer

```
A=input()
p=A[1:4]
print(f"Area code:{p}")
```

Status : Correct ***Marks : 10/10***

5. Problem Statement

Dhruv wants to write a program to slice a given string based on user-defined start and end positions.

The program should check whether the provided positions are valid and then return the sliced portion of the string if the positions are within the string's length.

Input Format

The first line consists of the input string as a string.

The second line consists of the start position (0-based index) as an integer.

The third line consists of the end position (0-based index) as an integer.

Output Format

The output displays the following format:

If the start and end positions are valid, print the sliced string.

If the start and end positions are invalid, print "Invalid start and end positions".

Refer to the sample output for formatting specifications.

Sample Test Case

Input: pythonprogramming
0
5
Output: python

Answer

```
str1=input()
start=int(input())
end=int(input())
if(0<=start<=end<len(str1)):
   print(str1[start:end+1])
else:
   print("Invalid start and end positions")
```

Status : Correct ***Marks : 10/10***

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NeoColab_REC_CS23221_Python Programming

REC_Python_Week 4_COD_Updated

Attempt : 1
Total Mark : 50
Marks Obtained : 50

Section 1 : Coding

1. Problem Statement

Sneha is building a more advanced exponential calculator. She wants to implement a program that does the following:

Calculates the result of raising a given base to a specific exponent using Python's built-in pow() function.Displays all intermediate powers from base¹ to base^exponent as a list.Calculates and displays the sum of these intermediate powers.

Help her build this program to automate her calculations.

Input Format

The input consists of line-separated two integer values representing base and exponent.

Output Format

The first line of the output prints the calculated result of raising the base to the exponent.

The second line prints a list of all powers from base^1 to base^exponent.

The third line prints the sum of all these powers.

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 2
3
Output: 8
[2, 4, 8]
14

Answer

```
# You are using Python
a=int(input())
b=int(input())
l=[]
print(pow(a,b))
for i in range(1,b+1):
    c=pow(a,i)
    l.append(c)
print(l)
print(sum(l))
```

Status : Correct ***Marks : 10/10***

2. Problem Statement

Implement a program that needs to identify Armstrong numbers. Armstrong numbers are special numbers that are equal to the sum of their digits, each raised to the power of the number of digits in the number.

Write a function is_armstrong_number(number) that checks if a given number is an Armstrong number or not.

Function Signature: armstrong_number(number)

Input Format

The first line of the input consists of a single integer, n, representing the number to be checked.

Output Format

The output should consist of a single line that displays a message indicating whether the input number is an Armstrong number or not.

Refer to the sample output for the formatting specifications.

Sample Test Case

Input: 153

Output: 153 is an Armstrong number.

Answer

```
# You are using Python
def is_armstrong_number(a):
    sum=0
    l=str(a)
    m=len(l)
    for i in l:
        sum+=int(i)**m
    if sum==a:
        print(f"{a} is an Armstrong number.")
    else:
        print(f"{a} is not an Armstrong number.")
a=int(input())
is_armstrong_number(a)
```

Status : Correct ***Marks : 10/10***

3. Problem Statement

Imagine you are building a messaging application, and you want to know the length of the messages sent by the users. You need to create a program that calculates the length of a message using the built-in function len().

Input Format

The input consists of a string representing the message.

Output Format

The output prints an integer representing the length of the entered message.

Refer to the sample output for formatting specifications.

Sample Test Case

Input: hello!!
Output: 7

Answer

```
# You are using Python
a=input()
print(len(a))
```

Status : Correct ***Marks : 10/10***

4. Problem Statement

Sara is developing a text-processing tool that checks if a given string starts with a specific character or substring. She needs to implement a function that accepts a string and a character (or substring), and returns True if the string starts with the provided character/substring, or False otherwise.

Write a program that uses a lambda function to help Sara perform this check.

Input Format

The first line contains a string `str` representing the main string to be checked.

The second line contains a string `n`, which is the character or substring to check if the main string starts with it.

Output Format

The first line of output prints "True" if the string starts with the given character/ substring, otherwise prints "False".

Refer to the sample for the formatting specifications.

Sample Test Case

Input: Examly
e

Output: False

Answer

```
# You are using Python
a=input()
b=input()
check=lambda a,b:a.startswith(b)
print(check(a,b))
```

Status : Correct ***Marks : 10/10***

5. Problem Statement

Imagine you are developing a text analysis tool for a cybersecurity company. Your task is to create a function that analyzes input strings to categorize and count the characters into four categories: uppercase letters, lowercase letters, digits, and special characters. The company needs this tool to process log files and identify potential security threats.

Function Signature: analyze_string(input_string)

Input Format

The input consists of a single string (without space), which may include uppercase letters, lowercase letters, digits, and special characters.

Output Format

The first line contains an integer representing the count of uppercase letters in the format "Uppercase letters: [count]".

The second line contains an integer representing the count of lowercase letters in the format "Lowercase letters: [count]".

The third line contains an integer representing the count of digits in the format "Digits: [count]".

The fourth line contains an integer representing the count of special characters in the format "Special characters: [count]".

Refer to the sample output for the formatting specifications.

Sample Test Case

Input: Hello123

Output: Uppercase letters: 1
Lowercase letters: 4
Digits: 3
Special characters: 0

Answer

```
def analyze_string(input_string):

# You are using Python
    #Type your code here
    u=l=d=s=0
    for i in input_string:
        if i.isupper():
            u+=1
        elif i.islower():
                l+=1
        elif i.isdigit():
```

```
            d+=1
        else:
            s+=1
    return u,l,d,s

input_string = input()
uppercase_count, lowercase_count, digit_count, special_count =
analyze_string(input_string)

print("Uppercase letters:", uppercase_count)
print("Lowercase letters:", lowercase_count)
print("Digits:", digit_count)
print("Special characters:", special_count)
```

Status : Correct ***Marks : 10/10***

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NeoColab_REC_CS23221_Python Programming

REC_Python_Week 5_COD

Attempt : 1
Total Mark : 50
Marks Obtained : 20

Section 1 : Coding

1. Problem Statement

James is managing a list of inventory items in a warehouse. Each item is recorded as a tuple, where the first element is the item ID and the second element is a list of quantities available for that item. James needs to filter out all quantities that are above a certain threshold to find items that have a stock level above this limit.

Help James by writing a program to process these tuples, filter the quantities from all the available items, and display the results.

Note:

Use the filter() function to filter out the quantities greater than the specified threshold for each item's stock list.

Input Format

The first line of input consists of an integer N, representing the number of tuples.

The next N lines each contain a tuple in the format (ID, [quantity1, quantity2, ...]), where ID is an integer and the list contains integers.

The final line consists of an integer threshold, representing the quantity threshold.

Output Format

The output should be a single line displaying the filtered quantities, space-separated. Each quantity is strictly greater than the given threshold.

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 2
(1, [1, 2])
(2, [3, 4])
2

Output: 3 4

Answer

```
N = int(input())
items = [eval(input()) for _ in range(N)]
threshold = int(input())

result =[]
for item in items:
    result.extend(filter(lambda x: x>threshold, item[1]))

print(" ".join(map(str, result)))
```

Status : Correct ***Marks : 10/10***

2. Problem Statement

Ella is analyzing the sales data for a new online shopping platform. She has a record of customer transactions where each customer's data includes their ID and a list of amounts spent on different items. Ella needs to determine the total amount spent by each customer and identify the highest single expenditure for each customer.

Your task is to write a program that computes these details and displays them in a dictionary.

Input Format

The first line of input consists of an integer n, representing the number of customers.

Each of the next n lines contains a numerical customer ID followed by integers representing the amounts spent on different items.

Output Format

The output displays a dictionary where the keys are customer IDs and the values are lists containing two integers: the total expenditure and the maximum single expenditure.

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 2
101 100 150 200
102 50 75 100
Output: {101: [450, 200], 102: [225, 100]}

Answer

-

Status : Skipped ***Marks : 0/10***

3. Problem Statement

Liam is analyzing a list of product IDs from a recent sales report. He needs to determine how frequently each product ID appears and calculate the following metrics:

Frequency of each product ID: A dictionary where the key is the product ID and the value is the number of times it appears.Total number of unique product IDs.Average frequency of product IDs: The average count of all product IDs.

Write a program to read the product IDs, compute these metrics, and output the results.

Example

Input:

6 //number of product ID

101

102

101

103

101

102 //product IDs

Output:

{101: 3, 102: 2, 103: 1}

Total Unique IDs: 3

Average Frequency: 2.00

Explanation:

Input 6 indicates that you will enter 6 product IDs.

A dictionary is created to track the frequency of each product ID.

Input 101: Added with a frequency of 1.

Input 102: Added with a frequency of 1.

Input 101: Frequency of 101 increased to 2.

Input 103: Added with a frequency of 1.

Input 101: Frequency of 101 increased to 3.

Input 102: Frequency of 102 increased to 2.

The dictionary now contains 3 unique IDs: 101, 102, and 103.

Total Unique is 3.

The average frequency is 2.00.

Input Format

The first line of input consists of an integer n, representing the number of product IDs.

The next n lines each contain a single integer, each representing a product ID.

Output Format

The first line of output displays the frequency dictionary, which maps each product ID to its count.

The second line displays the total number of unique product IDs, preceded by "Total Unique IDs: ".

The third line displays the average frequency of the product IDs. This is calculated by dividing the total number of occurrences of all product IDs by the total number of unique product IDs, rounded to two decimal places. It is preceded by "Average Frequency: ".

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 6
101
102
101

103
101
102

Output: {101: 3, 102: 2, 103: 1}
Total Unique IDs: 3
Average Frequency: 2.00

Answer

```
from collections import Counter

n=int(input())
product_ids=[int(input()) for _ in range(n)]
freq=Counter(product_ids)
total_unique=len(freq)
average_freq=sum(freq.values())/total_unique if total_unique else 0


print(dict(freq))
print(f"Total Unique IDs:{total_unique}")
print(f"Average Frequency:{average_freq:.2f}")
```

Status : Correct ***Marks : 10/10***

4. Problem Statement

Gowshik is working on a task that involves taking two lists of integers as input, finding the element-wise sum of the corresponding elements, and then creating a tuple containing the sum values.

Write a program to help Gowshik with this task.

Example:

Given list:

[1, 2, 3, 4]

[3, 5, 2, 1]

An element-wise sum of the said tuples: (4, 7, 5, 5)

Input Format

The first line of input consists of a single integer n, representing the length of the input lists.

The second line of input consists of n integers separated by commas, representing the elements of the first list.

The third line of input consists of n integers separated by commas, representing the elements of the second list.

Output Format

The output is a single line containing a tuple of integers separated by commas, representing the element-wise sum of the corresponding elements from the two input lists.

Refer to the sample output for the formatting specifications.

Sample Test Case

Input: 4
1, 2, 3, 4
3, 5, 2, 1
Output: (4, 7, 5, 5)

Answer

-

Status : Skipped ***Marks : 0/10***

5. Problem Statement

Professor Adams needs to analyze student participation in three recent academic workshops. She has three sets of student IDs: the first set contains students who registered for the workshops, the second set contains students who actually attended, and the third set contains students who dropped out.

Professor Adams needs to determine which students who registered also attended, and then identify which of these students did not drop out.

Help Professor Adams identify the students who registered, attended, and did not drop out of the workshops.

Input Format

The first line of input consists of integers, representing the student IDs who registered for the workshops.

The second line consists of integers, representing the student IDs who attended the workshops.

The third line consists of integers, representing the student IDs who dropped out of the workshops.

Output Format

The first line of output displays the intersection of the first two sets, which shows the IDs of students who registered and attended.

The second line displays the result after removing student IDs that are in the third set (dropped out), showing the IDs of students who both attended and did not drop out.

Refer to the sample output for the formatting specifications.

Sample Test Case

Input: 1 2 3
2 3 4
3 4 5

Output: {2, 3}
{2}

Answer

-

Status : Skipped ***Marks : 0/10***

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NeoColab_REC_CS23221_Python Programming

REC_Python_Week 6_COD

Attempt : 1
Total Mark : 50
Marks Obtained : 0

Section 1 : Coding

1. Problem Statement

Write a program that calculates the average of a list of integers. The program prompts the user to enter the length of the list (n) and each element of the list. It performs error handling to ensure that the length of the list is a non-negative integer and that each input element is a numeric value.

Input Format

The first line of the input is an integer n, representing the length of the list as a positive integer.

The second line of the input consists of an element of the list as an integer, separated by a new line.

Output Format

If the length of the list is not a positive integer or zero, the output displays "Error: The length of the list must be a non-negative integer."

If a non-numeric value is entered for the length of the list, the output displays "Error: You must enter a numeric value."

If a non-numeric value is entered for a list element, the output displays "Error: You must enter a numeric value."

If the inputs are valid, the program calculates and prints the average of the provided list of integers with two decimal places: "The average is: [average]".

Refer to the sample output for the formatting specifications.

Sample Test Case

Input: -2
1
2
Output: Error: The length of the list must be a non-negative integer.

Answer

-

Status : Skipped ***Marks : 0/10***

2. Problem Statement

In a voting system, a person must be at least 18 years old to be eligible to vote. If a user enters an age below 18, the system should raise a user-defined exception indicating that they are not eligible to vote.

Input Format

The input contains a positive integer representing age.

Output Format

If the age is less than 18, the output displays "Not eligible to vote".

Otherwise, the output displays "Eligible to vote".

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 18
Output: Eligible to vote

Answer

-

Status : Skipped ***Marks : 0/10***

3. Problem Statement

Sophie enjoys playing with words and wants to count the number of words in a sentence. She inputs a sentence, saves it to a file, and then reads it from the file to count the words.

Write a program to determine the number of words in the input sentence.

File Name: sentence_file.txt

Input Format

The input consists of a single line of text containing words separated by spaces.

Output Format

The output displays the count of words in the sentence.

Refer to the sample output for the formatting specifications.

Sample Test Case

Input: Four Words In This Sentence
Output: 5

Answer

-

Status : *-* ***Marks : 0/10***

4. Problem Statement

A retail store requires a program to calculate the total cost of purchasing a product based on its price and quantity. The program performs validation to ensure valid inputs and handles specific error conditions using exceptions:

Price Validation: If the price is zero or less, raise a ValueError with the message: "Invalid Price".Quantity Validation: If the quantity is zero or less, raise a ValueError with the message: "Invalid Quantity".Cost Threshold: If the total cost exceeds 1000, raise RuntimeError with the message: "Excessive Cost".

Input Format

The first line of input consists of a double value, representing the price of a product.

The second line consists of an integer, representing the quantity of the product.

Output Format

If the calculation is successful, print the total cost rounded to one decimal place.

If the price is zero or less prints "Invalid Price".

If the quantity is zero or less prints "Invalid Quantity".

If the total cost exceeds 1000, prints "Excessive Cost".

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 20.0
5
Output: 100.0

Answer

-

Status : - ***Marks : 0/10***

5. Problem Statement

Tara is a content manager who needs to perform case conversions for various pieces of text and save the results in a structured manner.

She requires a program to take a user's input string, save it in a file, and then retrieve and display the string in both upper-case and lower-case versions. Help her achieve this task efficiently.

File Name: text_file.txt

Input Format

The input consists of a single line containing a string provided by the user.

Output Format

The first line displays the original string read from the file in the format: "Original String: {original_string}".

The second line displays the upper-case version of the original string in the format: "Upper-Case String: {upper_case_string}".

The third line displays the lower-case version of the original string in the format: "Lower-Case String: {lower_case_string}".

Refer to the sample output for the formatting specifications.

Sample Test Case

Input: #SpecialSymBoLs1234

Output: Original String: #SpecialSymBoLs1234
Upper-Case String: #SPECIALSYMBOLS1234
Lower-Case String: #specialsymbols1234

Answer

-

Status : *-* ***Marks : 0/10***