Write the program using any one of the programming language.

- **C**
- **C++**
- **Java**
- **Python**

01. Problem Description:

The function accepts two positive integers ‘r’ and ‘unit’ and a positive integer array ‘arr’ of size ‘n’ as its argument ‘r’ represents the number of rats present in an area, ‘unit’ is the amount of food each rat consumes and each ith element of array ‘arr’ represents the amount of food present in ‘i+1’ house number, where 0 <= i

Note:

- Return -1 if the array is null
- Return 0 if the total amount of food from all houses is not sufficient for all the rats.
- Computed values lie within the integer range.

Example:

Input:

- r: 7
- unit: 2
- n: 8
- arr: 2 8 3 5 7 4 1 2

Output:

4

Explanation:

Total amount of food required for all rats = r * unit

= 7 * 2 = 14.

The amount of food in 1st houses = 2+8+3+5 = 18. Since, amount of food in 1st 4 houses is sufficient for all the rats. Thus, output is 4.

02. Problem Description:

The Binary number system only uses two digits, 0 and 1 and number system can be called binary string. You are required to implement the following function:

int OperationsBinaryString(char* str);

The function accepts a string str as its argument. The string str consists of binary digits separated with an alphabet as follows:

- – A denotes AND operation
- – B denotes OR operation
- – C denotes XOR Operation

You are required to calculate the result of the string str, scanning the string to right taking one operation at a time, and return the same.

Note:

- No order of priorities of operations is required
- Length of str is odd
- If str is NULL or None (in case of Python), return -1

Input:
str: 1C0C1C1A0B1

Output:
1

Explanation:
The alphabets in str when expanded becomes “1 XOR 0 XOR 1 XOR 1 AND 0 OR 1”, result of the expression becomes 1, hence 1 is returned.

03. Problem description:

You are given a function.

int CheckPassword(char str[], int n);

The function accepts string str of size n as an argument. Implement the function which returns 1 if given string str is valid password else 0.

str is a valid password if it satisfies the below conditions.

- – At least 4 characters
- – At least one numeric digit
- – At Least one Capital Letter
- – Must not have space or slash (/)
- – Starting character must not be a number

Assumption:

Input string will not be empty.

Example:

Input 1:

aA1_67

Input 2:

a987 abC012

Output 1:
1
Output 2:
0

04. Problem description:

You are given a function,

int findCount(int arr[], int length, int num, int diff);

The function accepts an integer array ‘arr’, its length and two integer variables ‘num’ and ‘diff’. Implement this function to find and return the number of elements of ‘arr’ having an absolute difference of less than or equal to ‘diff’ with ‘num’.

Note: In case there is no element in ‘arr’ whose absolute difference with ‘num’ is less than or equal to ‘diff’, return -1.

Example:

Input:

- **arr: 12 3 14 56 77 13**
- **num: 13**
- **diff: 2**

Output:

3

Explanation:

Elements of ‘arr’ having absolute difference of less than or equal to ‘diff’ i.e. 2 with ‘num’ i.e. 13 are 12, 13 and 14.

05. Problem description:

Implement the following Function

def differenceofSum(n. m)

The function accepts two integers n, m as arguments Find the sum of all numbers in range from 1 to m(both inclusive) that are not divisible by n. Return difference between sum of integers not divisible by n with sum of numbers divisible by n.

Assumption:

- n>0 and m>0
- Sum lies between integral range

Example

Input

n:4

m:20

Output

90

Explanation

- Sum of numbers divisible by 4 are 4 + 8 + 12 + 16 + 20 = 60
- Sum of numbers not divisible by 4 are 1 +2 + 3 + 5 + 6 + 7 + 9 + 10 + 11 + 13 + 14 + 15 + 17 + 18 + 19 = 150
- Difference 150 – 60 = 90

Sample Input

n:3

m:10

Sample Output

19

06. Problem description:

You are required to implement the following Function

def LargeSmallSum(arr)

The function accepts an integers arr of size 'length' as its arguments you are required to return the sum of second largest element from the even positions and second smallest from the odd position of given 'arr'

Assumption:

- All array elements are unique
- Treat the 0th position as even

NOTE

- Return 0 if array is empty
- Return 0, if array length is 3 or less than 3

Example

Input

arr:3 2 1 7 5 4

Output

7

Explanation

- Second largest among even position elements(1 3 5) is 3
- Second smallest among odd position element is 4
- Thus output is 3+4 = 7

Sample Input

arr:1 8 0 2 3 5 6

Sample Output

8