B.Sc(H) Computer Science II year

Programming in Python

Assignment

1) Write a python program for the following problem -

There is an array of n integers. There are also **2 disjoint sets**, A and B, each containing m integers. You like all the integers in set A and dislike all the integers in set B. Your initial happiness is 0. For each i integer in the array, if $i \in A$, you add 1 to your happiness. If $i \in B$, you add -1 to your happiness. Otherwise, your happiness does not change. Output your final happiness at the end.

Note: Since A and B are sets, they have no repeated elements. However, the array might contain duplicate elements.

Constraints

$1 \leq n \leq 10^5$
$1 \leq m \leq 10^5$
$1 \leq$ *Any integer in the input* $\leq 10^9$

Input Format

The first line contains integers n and m separated by a space.
The second line contains n integers, the elements of the array.
The third and fourth lines contain m integers, A and B, respectively.

Output Format

Output a single integer, your total happiness.

Sample Input

```
3 2
1 5 3
3 1
5 7
```

Sample Output

```
1
```

Explanation

You gain 1 unit of happiness for elements 3 and 1 in set A. You lose 1 unit for 5 in set B. The element 7 in set B does not exist in the array so it is not included in the calculation.

Hence, the total happiness is $2 - 1 = 1$.

2) Write a Python program for the following problem -

You are given a string S.
S contains alphanumeric characters only.

Sorting

Your task is to sort the string S in the following manner:

- All sorted *lowercase letters* are ahead of *uppercase letters*.
- All sorted *uppercase letters* are ahead of digits.
- All sorted *odd digits* are ahead of sorted *even digits*.

Input Format

A single line of input contains the string S.

Constraints

$0 < len(S) < 1000$

Output Format

Output the sorted string S.

Sample Input

```
Sorting1234
```

Sample Output

```
ginortS1324
```

3) Write a Python program for the following problem -

Return the sum of the numbers in the list, except ignore sections of numbers starting with a 6 and extending to the next 7 (every 6 will be followed by at least one 7). Return 0 for no numbers.

sum67([1, 2, 2]) → 5
sum67([1, 2, 2, 6, 99, 99, 7]) → 5
sum67([1, 1, 6, 7, 2]) → 4
sum67([2,3,6,4,5,7,7]) → 12

4) Given a nested list, convert it into a dictionary with elements from the first list element serving as keys and subsequent list elements acting as their corresponding values.

Input *: input_list = [[4, 5, 7], [10, 8, 4], [19, 4, 6], [9, 3, 6]]*
Output *: {4: [10, 19, 9], 5: [8, 4, 3], 7: [4, 6, 6]}*

5) Write a Python program to sort the elements at odd positions in ascending order and the elements at even positions in descending order.

Input *: input_list = [7, 10, 11, 3, 6, 9, 2, 13, 0]*
Output *: [11, 3, 7, 9, 6, 10, 2, 13, 0]*