**Problem Statement 1:-**

**Find the Most Frequently Occurring Digit in a series of numbers.**

Kamal is a data analyst in a lottery management organization.

One of the tasks assigned to Kamal is to find the Most Frequently Occurring Digit in a series of input numbers.

Below are a couple of examples to illustrate how to find the Most Frequently Occurring Digit in a series of input numbers.

**Example1 –**

If the series of input numbers are [1237, 262, 666, 140]

We notice that,

0 occurs 1 time

1 occurs 2 times

2 occurs 3 times

3 occurs 1 time

4 occurs 1 time

5 occurs 0 times

6 occurs 4 times

7 occurs 1 time

8 occurs 0 times

9 occurs 0 times

We observe that –

4 is the highest frequency in this series, and,

6 is the digit that occurs 4 times.

Thus, the Most Frequently Occurring Digit in this series is 6.

**NOTE:** If more than one digit occur the most frequent time, then the largest of the digits should be chosen as the answer. See below example for clarity on this point.

**Example2 –**

If the series of input numbers is [1237, 202, 666, 140]

We notice that,

0 occurs 2 times

1 occurs 2 times

2 occurs 3 times

3 occurs 1 time

4 occurs 1 time

5 occurs 0 times

6 occurs 3 times

7 occurs 1 time

8 occurs 0 times

9 occurs 0 times

We observe that –

3 is the highest frequency in this series, and,

2 and 6 are the digits that occur 3 times.

The larger of the two digits (2 and 6) is 6. Thus, the Most Frequently Occurring Digit in this series is 6.

Help Kamal by writing the logic in the function mostFrequentlyOccurringDigit for finding the Most Frequently Occurring Digit in the provided series of numbers.

The function takes two inputs -

input1 is the array of numbers

input2 is the number of elements in the array input1

**Problem Statement 2:-**

**Sum of Powers of Digits:** Alex has been asked by his teacher to do an assignment on powers of numbers. The assignment requires Alex to find the sum of powers of each digit of a given number, as per the method mentioned below.

If the given number is 582109, the Sum of Powers of Digits will be calculated as =

= (5 raised to the power of 8) + (8 raised to the power of 2) + (2 raised to the power of 1) + (1 raised to the power of 0) + (0 raised to the power of 9) + (9 raised to the power of 0)

i.e. each digit of the number is raised to the power of the next digit on its right-side. Note that the right-most digit has to be raised to the power of 0. The sum of all of these powers is the expected result to be calculated.

**Example -** If the given number is 582109, the Sum of Powers of Digits =

= (5 raised to the power of 8) + (8 raised to the power of 2) + (2 raised to the power of 1) + (1 raised to the power of 0) + (0 raised to the power of 9) + (9 raised to the power of 0)

= 390625 + 64 + 2 + 1 + 0 + 1 = 390693

Alex contacts you to help him write a program for finding the Sum of Powers of Digits for any given number, using the above method.

Write the logic in the given function  sumOfPowerOfDigits where,

input1 represents the given number.

The function is expected to return the "Sum of Powers of Digits" of input1.

Assumptions: For this assignment, let us assume that the given number will always contain more than 1 digit, i.e. the given number will always be >9.

**Problem Statement 3:-**

**Sum of Sums of Digits in Cyclic order**: Alex has been asked by his teacher to do an assignment on sums of digits of a number. The assignment requires Alex to find the sum of sums of digits of a given number, as per the method mentioned below.

If the given number is 582109, the Sum of Sums of Digits will be calculated as =

= (5 + 8 + 2 + 1 + 0 + 9) + (8 + 2 + 1 + 0 + 9) + (2 + 1 + 0 + 9) + (1 + 0 + 9) + (0 + 9) + (9)

= 25 + 20 + 12 + 10 + 9 + 9 = 85

Alex contacts you to help him write a program for finding the Sum of Sums of Digits for any given number, using the above method.

Help Alex by completing the login in the given function  sumOfSumsOfDigits which takes as input an integer input1 representing the given number.

The function is expected to return the "Sum of Sums of Digits" of input1.

**Assumptions:** For this assignment, let us assume that the given number will always contain more than 1 digit, i.e. the given number will always be >9.