# 1926C - Vlad and a Sum of Sum of Digits

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## 1 Problem

Problem Description : https://codeforces.com/contest/1926/problem/C

## 2 Objective

Given $t$ numbers of $n$, find the sum of digits of number $n$ of the $n$ first numbers for every given number $n$.

## 3 Solution

We iterate from 1 to $n$ to find the sum of sum of the digits of every number $n$. We can use modulus and division operation to extract each digit of the number $n$, then sum all the digits. we can use prefix sum array to store the answer so that we don't need to find the sum of digits of $n$ previous numbers all over again. For example, if the given number $n$ is 11, then the sum of the digits for every $n$ first numbers is $1, 2, 3, 4, 5, 6, 7, 8, 9, 1, 2$. So the answer is 48.

# 4 Code

```
#include <iostream>
#include <cmath>
#include <vector>
#include <algorithm>
using namespace std;
const int P = 1e9 + 7;

 int main() {
        vector <int> dp(2e5+1, -1);
        int sum = 0;
        for(int i=1; i<=2e5; i++) {
                sum += i%10 + i/10%10 + i/100%10 + i/1000%10 + i/10000%10
                + i/100000%10;
                dp[i] = sum;
        }

        int t;
        cin >> t;
        while(t--){
                int n;
                cin >> n;
                cout << dp[n] << endl;
        }
        return 0;
 }
```