



DEPARTMENT OF

COMPUTER SCIENCE & ENGINEERING

Discover. Learn. Empower.

Day 1

Student Name: Jaysheel Bhatt

UID: 21BCS5088

Branch: B.E. CSE

Section/Group: CC-613-A

Subject Name: IT Skills

Date of Performance: 24-06-2024

Question 1. Helping Machine

A machine recycles scrap bottles, the size of the bottle is categorised into types. For n number of bottles you have to calculate the number of bottles in each category type.

Link: <https://www.codechef.com/problems/CMAN2?tab=statement>

Code:

```
import java.util.*;
import java.lang.*;
import java.io.*; class
Codechef
{
    public static void main (String[] args) throws java.lang.Exception
    {
        Scanner sc=new Scanner(System.in);
        int n=sc.nextInt();
        for(int i=0;i<n;i++){
            int noOfBottle=sc.nextInt();
            int type1=0;
            int type2=0;          int type3=0;
            for(int j=0;j<noOfBottle;j++){

                int bottle=sc.nextInt();
                if(bottle==1 || bottle==2){
                    type1++;
                }
                else if(bottle==3 || bottle==4){
                    type2++;
                }
                else if (bottle==5 || bottle==6){
                    type3++;
                }
            }
        }
    }
}
```

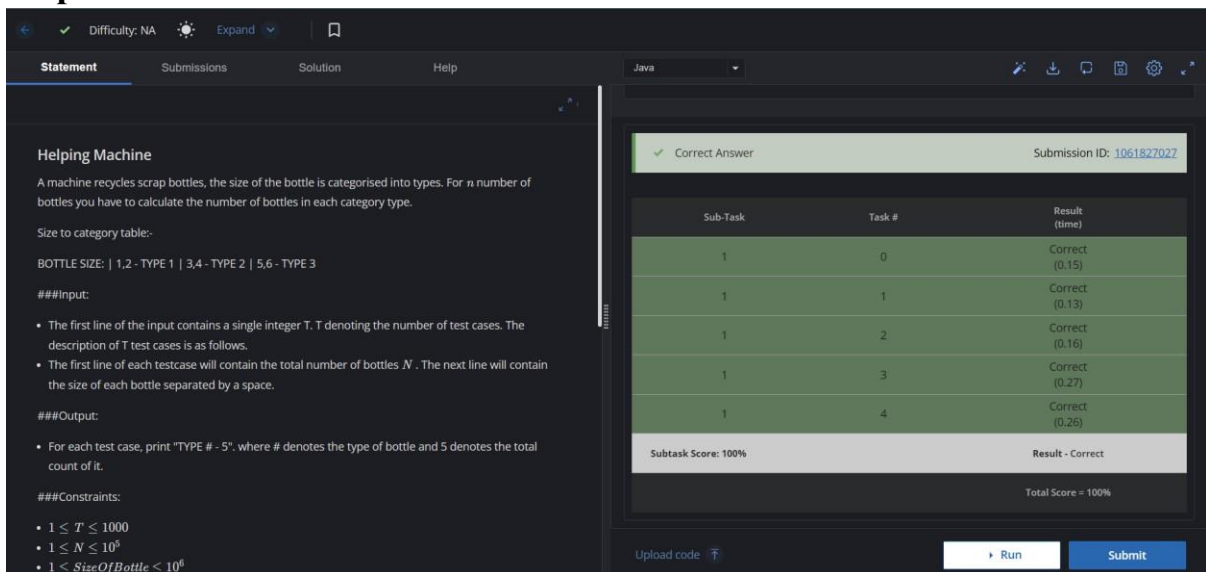
```

    }

    System.out.println("TYPE 1 - "+type1+" TYPE 2 - "+type2+" TYPE 3 - "+type3);
}
}
}
}

```

Output:



Helping Machine

A machine recycles scrap bottles, the size of the bottle is categorised into types. For n number of bottles you have to calculate the number of bottles in each category type.

Size to category table:

BOTTLE SIZE: | 1,2 - TYPE 1 | 3,4 - TYPE 2 | 5,6 - TYPE 3

###Input:

- The first line of the input contains a single integer T , T denoting the number of test cases. The description of T test cases is as follows.
- The first line of each test case will contain the total number of bottles N . The next line will contain the size of each bottle separated by a space.

###Output:

- For each test case, print "TYPE # - 5", where # denotes the type of bottle and 5 denotes the total count of it.

###Constraints:

- $1 \leq T \leq 1000$
- $1 \leq N \leq 10^5$
- $1 \leq \text{SizeOfBottle} \leq 10^6$

Submission ID: 1061827027

Sub-Task	Task #	Result (time)
1	0	Correct (0.15)
1	1	Correct (0.13)
1	2	Correct (0.16)
1	3	Correct (0.27)
1	4	Correct (0.26)

Subtask Score: 100% Result - Correct

Total Score = 100%

Question 2. Sum Of Digits

You are being given a number N . ($1 \leq N \leq 1000$). You have to print the sum of digits of that particular number.

Link: <https://www.codechef.com/submit/DEM3?tab=statement>

Code:

```

import java.util.*;
import java.lang.*;
import java.io.*; class
Codechef
{
    public static void main (String[] args) throws java.lang.Exception
    {
        BufferedReader bf = new BufferedReader(new
        InputStreamReader(System.in));
        int t = Integer.parseInt(bf.readLine());
    }
}

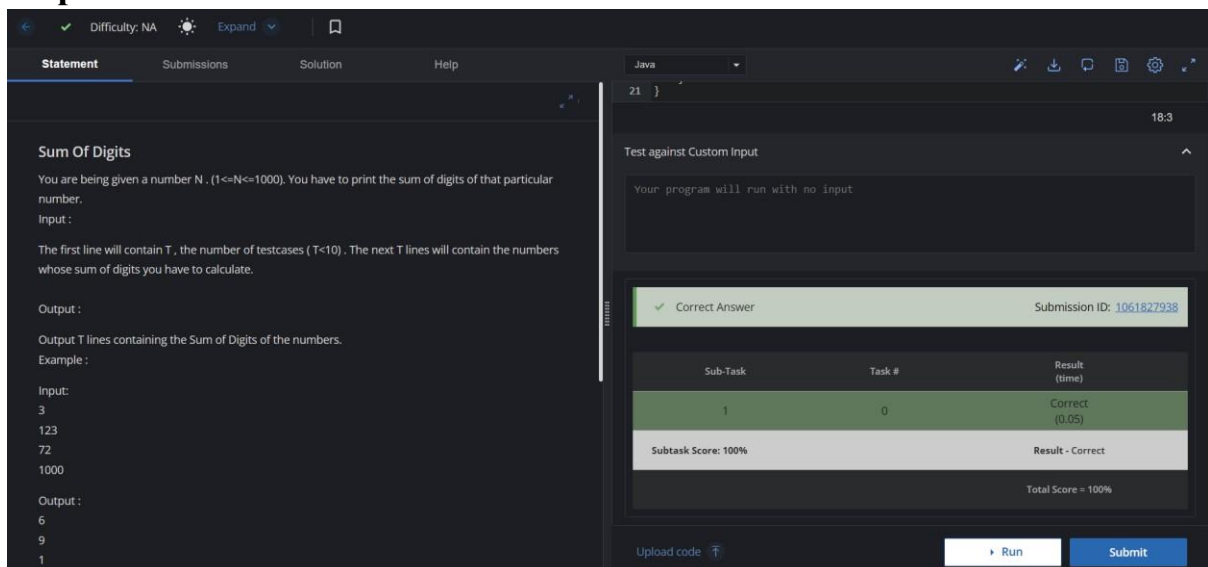
```

```

        while(t>0){
            String n = bf.readLine();
            char[] v = n.toCharArray();
            int ac = 0;
            for(char i:v){
                ac +=
                Character.getNumericValue(i);
            }
            System.out.println(ac);
            t--;
        }
    }
}

```

Output:



Sum Of Digits

You are being given a number N . ($1 \leq N \leq 1000$). You have to print the sum of digits of that particular number.

Input :

The first line will contain T , the number of testcases ($T \leq 10$). The next T lines will contain the numbers whose sum of digits you have to calculate.

Output :

Output T lines containing the Sum of Digits of the numbers.

Example :

Input:

```

3
123
72
1000

```

Output :

```

6
9
1

```

Test against Custom Input

Your program will run with no input

Correct Answer

Submission ID: 1061827938

Sub-Task	Task #	Result (time)
1	0	Correct (0.05)

Subtask Score: 100%

Result - Correct

Total Score = 100%

Upload code

Run Submit

Question3. Correct Sentence

You are given a sentence as a sequence of K words S_1, S_2, \dots, S_K . Determine whether it could be a sentence formed by Chef, i.e. if it contains only the characters from the two given languages and each word contains only characters from a single language.

Link: <https://www.codechef.com/problems/CORTSENT?tab=statement>

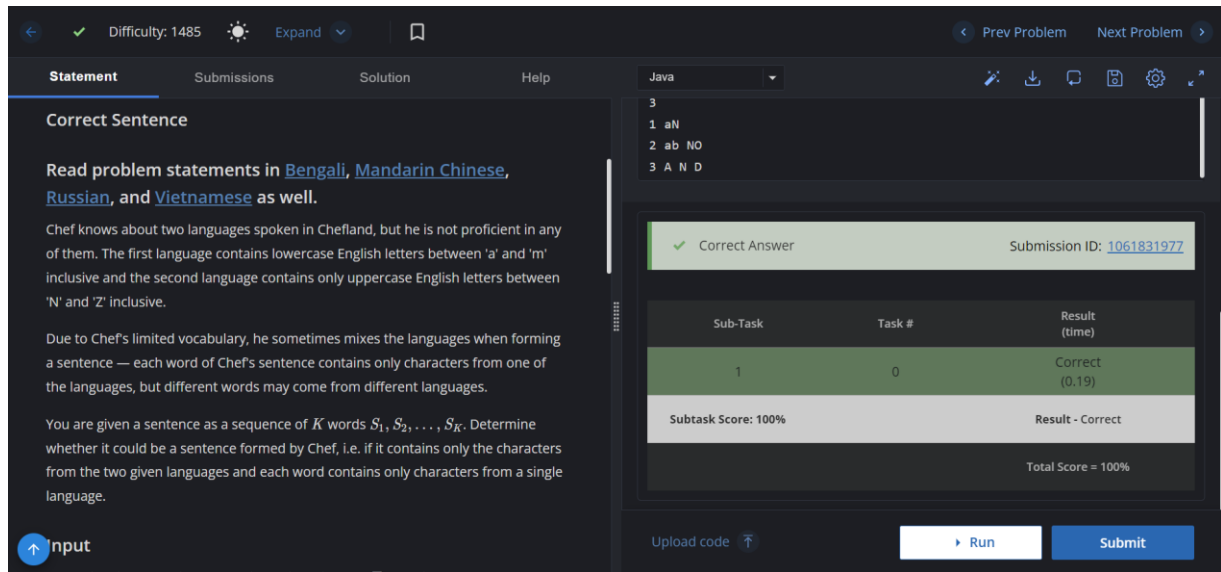
Code:

```
#include <iostream>
```

```
#include <bits/stdc++.h>
#include <string> using
namespace std;
int main()
{
    int t;
    cin >> t;
    while (t--)
    {

        cin >> k;
        vector<string> v;
        int ans=0;
        for (int i = 0; i < k; i++)
            for (int j = 0; j < k; j++)
            {
                string n = v[j];
                int cnt1=0,cnt2=0;
                for (int i = 0; i < n.size(); i++)
                {
                    if ((n[i] >= 'a' and n[i] <= 'm') )
                    {
                        cnt1++;
                    }
                    else if( (n[i] >= 'N' and n[i] <= 'Z')) cnt2++;
                    if(cnt1==n.size() and cnt2==0){
                        ans++;
                    }
                    else if( cnt2==n.size() and cnt1==0){
                        ans++;
                    }
                }
            }
        if(ans==k) cout<<"YES"<<endl;
        else cout<<"NO"<<endl;
    }
    return 0;
}
```

Output:



The screenshot shows the LeetCode interface for the problem 'Correct Sentence'. The problem statement is on the left, and the solution area is on the right. The solution area shows a 'Correct Answer' with a submission ID of 1061831977. Below this, a table shows the results for the sub-tasks.

Sub-Task	Task #	Result (time)
1	0	Correct (0.19)
Subtask Score: 100%		Result - Correct
Total Score = 100%		

Question 4. Basic Calculator

Given a string s representing a valid expression, implement a basic calculator to evaluate it, and return the result of the evaluation.

Link: <https://leetcode.com/problems/basic-calculator/description>

Code:

```
class Solution {
    public int calculate(final String s) {
        final Stack<Integer> stack = new Stack<>();
        int sign = 1, number = 0, result = 0;

        for(int i = 0; i < s.length(); ++i) {
            final char c = s.charAt(i);

            if(Character.isDigit(c)) {
                number = 10 * number + c - '0';
            } else if(c == '+') {
                result += sign * number;
                number = 0;
                sign = 1;
            } else if(c == '-') {
                result += sign * number;
                number = 0;
                sign = -1;
            } else if(c == '(') {
```

```

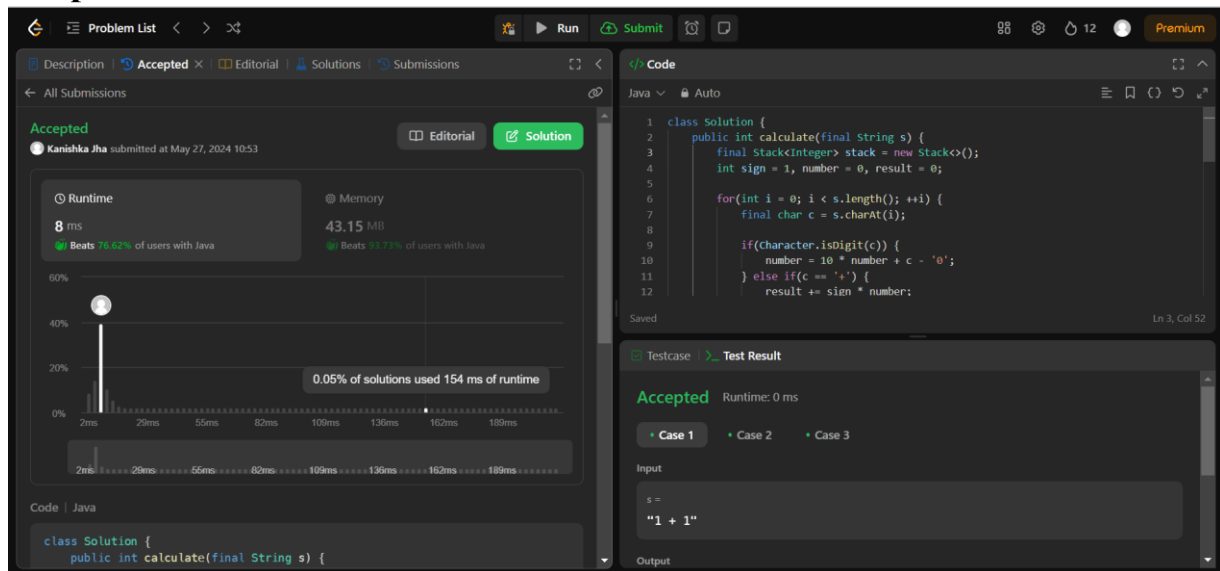
        stack.push(result);
        stack.push(sign);
        sign = 1;
        result = 0;
    } else if(c == '-') {
        result += sign * number;
        number = 0;
        result *= stack.pop();
        result += stack.pop();
    }
}

if(number != 0)
    result += sign * number;

return result;
}
}

```

Output:



Question 5. Kingdom of Fire and Ice

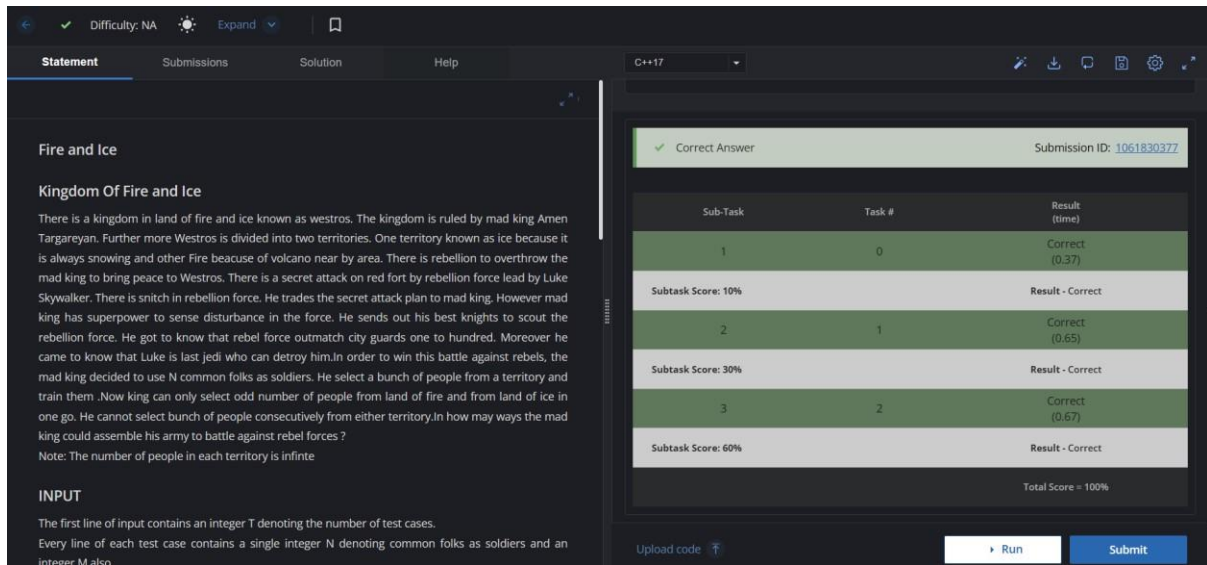
Link: <https://www.codechef.com/problems/FICE>

Code:

```
#include <stdio.h> #include<inttypes.h>
void multiply(uint64_t F[2][2], uint64_t M[2][2],uint64_t k);
void power(uint64_t F[2][2], uint64_t n,uint64_t k); uint64_t
fib(uint64_t n,uint64_t k) { uint64_t F[2][2] =
{{1,1},{1,0}}; if (n == 0) return 0; power(F, n-1,k);
return F[0][0];
}
void power(uint64_t F[2][2], uint64_t n,uint64_t k)
{
    if( n == 0 || n == 1) return;
    uint64_t M[2][2] = {{1,1},{1,0}};
    power(F, n/2,k); multiply(F, F,k);
    if (n%2 != 0) multiply(F, M, k);
} void multiply(uint64_t F[2][2], uint64_t M[2][2],uint64_t
k) {

    uint64_t x = (F[0][0]*M[0][0] + F[0][1]*M[1][0])%k;
    uint64_t y = (F[0][0]*M[0][1] + F[0][1]*M[1][1])%k;
    uint64_t z = (F[1][0]*M[0][0] + F[1][1]*M[1][0])%k;
    uint64_t w = (F[1][0]*M[0][1] + F[1][1]*M[1][1])%k; F[0][0]
= x;
    F[0][1] = y;
    F[1][0] = z;
    F[1][1] = w;
} int
main() {
    uint64_t n,k,t;
    scanf("%llu",&t); while(t--)
    {
        scanf("%llu",&n);
        scanf("%llu",&k);
        printf("%llu\n", (2*fib(n,k))%k);
    }
    return 0;
}
```

Output:



Statement Submissions Solution Help

Difficulty: NA Expand

Fire and Ice

Kingdom Of Fire and Ice

There is a kingdom in land of fire and ice known as westros. The kingdom is ruled by mad king Amen Targareyan. Further more Westros is divided into two territories. One territory known as ice because it is always snowing and other Fire because of volcano near by area. There is rebellion to overthrow the mad king to bring peace to Westros. There is a secret attack plan on red fort by rebellion force lead by Luke Skywalker. There is snitch in rebellion force. He trades the secret attack plan to mad king. However mad king has superpower to sense disturbance in the force. He sends out his best knights to scout the rebellion force. He got to know that rebel force outmatch city guards one to hundred. Moreover he came to know that Luke is last jedi who can destroy him. In order to win this battle against rebels, the mad king decided to use N common folks as soldiers. He select a bunch of people from a territory and train them. Now king can only select odd number of people from land of fire and from land of ice in one go. He cannot select bunch of people consecutively from either territory. In how many ways the mad king could assemble his army to battle against rebel forces?

Note: The number of people in each territory is infinite

INPUT

The first line of input contains an integer T denoting the number of test cases.
Every line of each test case contains a single integer N denoting common folks as soldiers and an integer M also.

Submission ID: 1061830377

Sub-Task	Task #	Result (time)
1	0	Correct (0.37)
Subtask Score: 10%		Result - Correct
2	1	Correct (0.65)
Subtask Score: 30%		Result - Correct
3	2	Correct (0.67)
Subtask Score: 60%		Result - Correct
Total Score = 100%		

Upload code Run Submit

Question 6. Count Good Numbers

A digit string is good if the digits (0-indexed) at even indices are even and the digits at odd indices are prime (2, 3, 5, or 7).

Link: <https://leetcode.com/problems/count-good-numbers/description/>

Code:

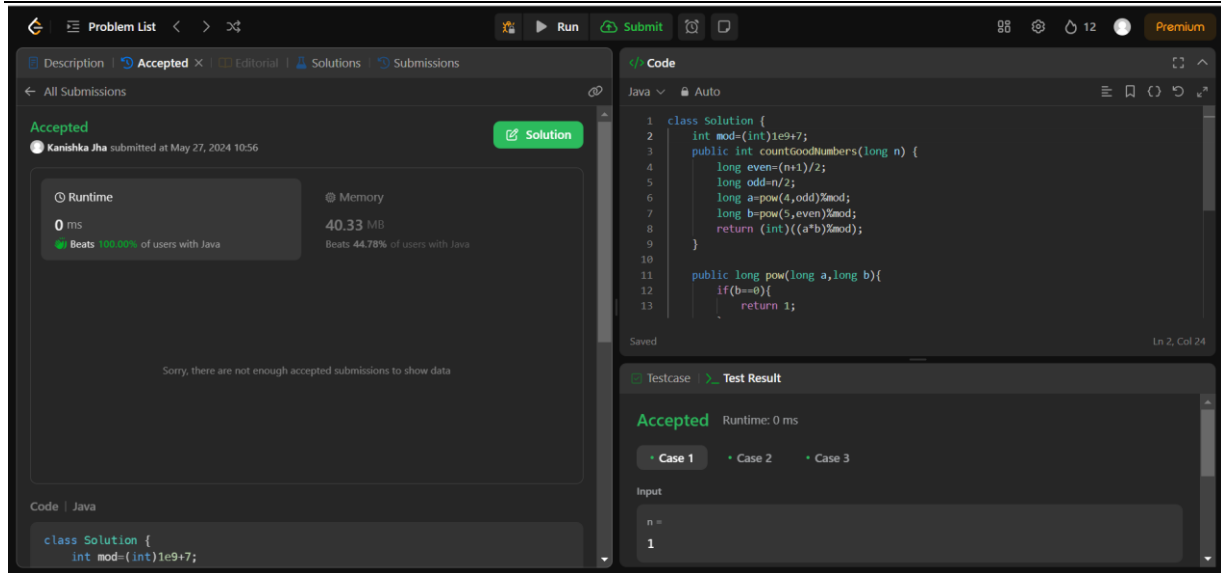
```
class Solution {
    int mod=(int)1e9+7;
    public int countGoodNumbers(long n) {
        long even=(n+1)/2;
        long odd=n/2;
        long a=pow(4,odd)%mod;
        long b=pow(5,even)%mod;
        return (int)((a*b)%mod);
    }

    public long pow(long a,long b){
        if(b==0){
            return 1;
        }
        long temp=pow(a,b/2);
        if(b%2==0){
            return (temp*temp)%mod;
        }
        else{
            return (a *temp*temp)%mod;
        }
    }
}
```



```
}  
}
```

Output:



The screenshot displays a coding environment with the following details:

- Problem List:** Accepted, Editorial, Solutions, Submissions.
- Accepted:** Kanishka Jha submitted at May 27, 2024 10:56.
- Runtime:** 0 ms, Beats 100.00% of users with Java.
- Memory:** 40.33 MB, Beats 44.78% of users with Java.
- Code:** Java, Auto. The code defines a class Solution with methods countGoodNumbers and pow.
- Testcase:** Accepted, Runtime: 0 ms.
- Input:** n = 1.

Learning Outcome:

- Practical world problem-solving.
- Many new complex concepts.
- Data Structure and Algorithm Concepts.
- Working with Codchef and LeetCode Compiler.