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Code : FA27QM

Task Description : Gambling

Some people are playing a gambling game. They all say a number between 1 and M. The winner is the person who first says the number that was said by the most of the players. If there is more than one such number, then all the players will win who were the first for such a "most frequent number".

Write a program that gives the winner player, the number the player won with, and the count of people who said this number

Task Specification

Input

$N \in \mathbb{N}$
 $M \in \mathbb{N}$
 $data \in \mathbb{N}^N$

Precondition

$1 \leq N \leq 100$
 $1 \leq M \leq 1,000,000$
 $\forall i (1 \leq i \leq N) : 1 \leq data_i \leq M$

Output

$maxcount \in \mathbb{N}$
 $ind [1..] \in \mathbb{N}^*$
 $val [1..] \in \mathbb{N}^*$

Postcondition

$\forall i (1 \leq i \leq N) : counts[data_i] = \sum_{j=1}^N 1_{data_j = data_i}$
 $\forall i (1 \leq i \leq M) : maxcount \geq count_i$
 $cnt = \sum_{i=1}^M 1_{counts[i] = maxcount}$
 $\forall i (1 \leq i \leq cnt) : counts[val_i] = maxcount$
and $val \leq data$
 $\forall i (1 \leq i \leq cnt) : data[ind_i] = val_i$

Variables I created

$counts \in \mathbb{N}^M$
 $cnt \in \mathbb{N}$

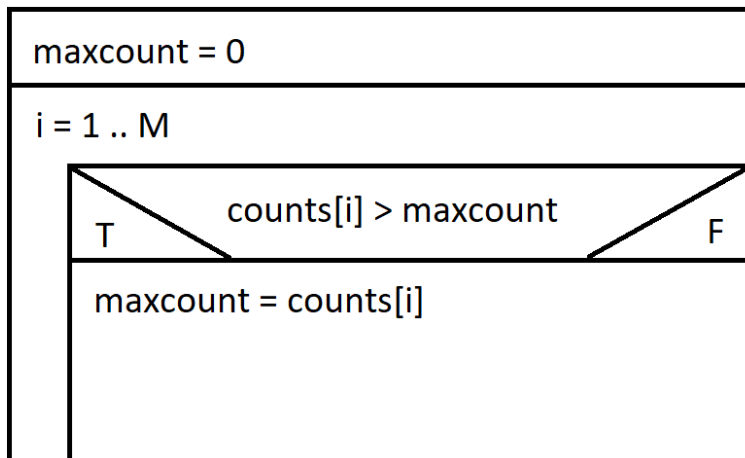
Algorithm

Part 1) Create an array which contains the count of the input numbers

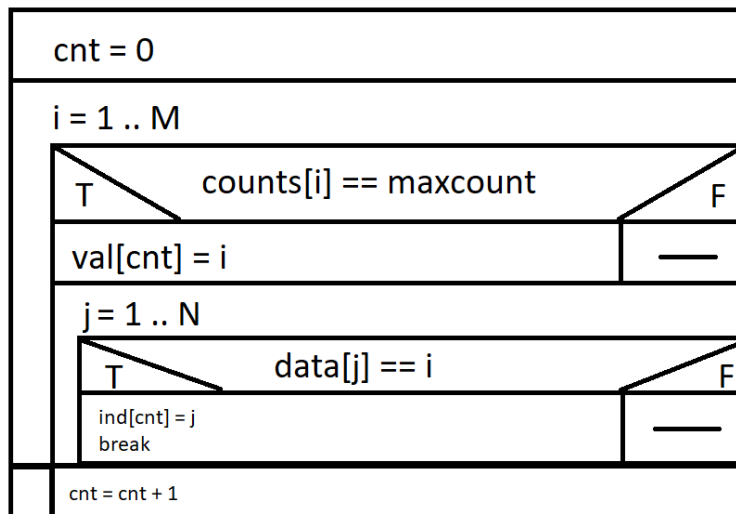
$i = 1 \dots N$

$counts[data[i]] = counts[data[i]] + 1$

Part 2) Find maxcount, which is the the maximum occurrence a number can have



Part 3) Store the values and indexes of the numbers that have occurred “maxcount” times



Implementation

```
using System;

namespace homework3
{
    internal class Program
    {
        static void Main(string[] args)
        {
            ///Declaration
            ///
            int N;
```

```

int M;
int[] data;
int maxcount = 0;

///Input
///

string[] tmp;
tmp = Console.ReadLine().Split(" ");
N = Int32.Parse(tmp[0]);
M = Int32.Parse(tmp[1]);

data = new int[N];
for (int i = 0; i < N; i++)
{
    do
    {
        data[i] = Int32.Parse(Console.ReadLine());
    } while (data[i] > M);
}
///Implementation
///
//Part 1 -> Create an array which contains the count of the
input numbers
int[] counts = new int[M+1];
for (int i = 0; i < N; i++)
{
    counts[data[i]]++;
}
//Part 2 -> Find maxcount, which is the the maximum occurrence
a number can have
for (int i = 0; i < M; ++i)
{
    if (counts[i] > maxcount)
    {
        maxcount = counts[i];
    }
}
//Part 3 -> Store the values and indexes of the numbers that
have occurred "maxcount" times
int[] val = new int[N];
int[] ind = new int[N];
int cnt = 0;
for(int i = 0; i<M; i++)
{
    if (counts[i] == maxcount)

```

```

        {
            val[cnt] = i;
            for (int j = 0; j < N; j++)
            {
                if (i == data[j])
                {
                    ind[cnt] = j;
                    break;
                }
            }
            cnt++;
        }

    }

    ///Output
    ///
    for (int i = 0; i < cnt; i++)
    {
        Console.WriteLine((ind[i]+1) + " " + val[i] + " " +
maxcount);
    }

}
}
}

```