Currency Exchange

Description

A new clerk is employed in a currency exchange office but he doesn't have enough experience to differentiate between currencies. He decided to ask indirect questions to the customers to widen his knowledge. He knows that the **USA Dollar ($) should be known by all customers**. Each customer **at least** knows his currency and USD dollar. **An American customer knows only his own currency**. All he can do with the customer is to show him a currency and ask him if he knows it or not (so as nobody notice his lake of experience).

Suppose the clerk has N currencies including USD dollar $. Show the **most efficient way** that the clerk gets to know the shape of the USD dollar currency. He is given a **N (customers) × M (currencies) matrix** containing whether a customer ***i*** knows the currency ***j*** or not. The clerk has to find the index of the USD Dollar $ with the smallest number of questions.

Note:

1- The clerk doesn't know the nationality of the customers and thus doesn't know the nationality of the American customer.

2- Each customer knows at least the USA dollar $ and more currencies

Complexity

The complexity of your code should be **less than $O(N^2)$**

Input: Already Implemented

The first line of input is an integer T (T < 2,000), that indicates the number of test cases. Each case consists of two integers that represent the number of customers (N) and the number of currencies (M) in a separate line. The next N lines represent the N×M matrix which contains customer ***i*** knows the currency ***j*** "Y" or not "N".

Output: Already Implemented

The index of the US Dollar $ (zero-based).

Function: Implement it!

```
int CheckUSD(int N, int M, bool [,] knows)
```

It takes the number of customers (`N`), the number of currencies (`M`) and the Boolean matrix that indicates whether customer ***i*** knows the currency ***j*** or not. It should return the index of the US Dollar ($).

Template

- C# template

Test Cases

N = 8, M = 6

	0	1	2	3	4	5
0	N	N	N	N	N	Y
1	N	N	N	N	N	Y
2	N	N	N	N	N	Y
3	N	N	N	N	N	Y
4	N	N	N	N	N	Y
5	N	N	N	N	N	Y
6	N	N	N	N	N	Y
7	N	N	N	N	N	Y

index of US Dollar is **5**

N = 5, M = 4

	0	1	2	3
0	N	Y	Y	Y
1	N	Y	Y	Y
2	N	Y	Y	Y
3	N	N	Y	N
4	N	Y	Y	Y

index of US Dollar is **2**

C# Help

If you need any help regarding the syntax of C#, **ask any TA during the office hours**.

Creating 1D array

```
int [] array1D = new int [size]
```

Creating 2D array

```
int [,] array2D = new int [size1, size2]
```

Getting the size of 1D array

```
int size = array1D.GetLength(0);
```

Getting the size of 2D array

```
int size1 = array2D.GetLength(0);

int size2 = array2D.GetLength(1);
```

Sorting single array

Sort the given array "items" in ascending order

```
Array.Sort(items);
```

Sorting parallel arrays

Sort the first array "master" and re-order the 2nd array "slave" according to this sorting

```
Array.Sort(master, slave);
```