

الشفرة المصدرية للحل الفأز بالمسابقة

```
//IsomorphicNumbers.cs
using System;
using System.IO;
namespace MohammadHi.VB4Arab.Contests{
    public class IsomorphicNumbers{
        private StreamReader input;
        private StreamWriter output;
        private bool stopFlag; // stop execution
        public IsomorphicNumbers(String inputFilePath, String outputFilePath){
            executeBatch(inputFilePath, outputFilePath);
        }
        // Summary: returns 'true' if 'number1' and 'number2' are members of the
        same isoset.
        //
        private bool isIsomorphic(String number1, String number2){
            if (number1.Length != number2.Length)
                return false;
            char nextMask = 'A';
            char[] digitMasks1 = new char[10]; // unique mask for each digit
            char[] digitMasks2 = new char[10];
            for (int i = 0; i < number1.Length; i++){
                int digit1 = number1[i] - '0';
                int digit2 = number2[i] - '0';
                if (digitMasks1[digit1] != digitMasks2[digit2]){
                    return false;
                }
                if (digitMasks1[digit1] == '\0' && digitMasks2[digit2] == '\0'){
                    // we see these digits for the first time
                    digitMasks1[digit1] = nextMask; // assign a mask to
                    digitMasks2[digit2] = nextMask; // assign the same mask to
                    nextMask++;
                }
            }
            return true;
        }
        //Summary:
        //calculates the cardinality, witch is the number of elements in the isoset
        //witch 'number' is a member of.
        //the 1st distinct digit has these possibilities: ( 1, 2, ..., 6, 7, 8, 9)
        //the 2nd distinct digit has 9 possibilities from (0, 1, 2, ..., 6, 7, 8, 9)
        //the 3rd distinct digit has 8 possibilities from (0, 1, 2, ..., 6, 7, 8, 9)
        //the 4th distinct digit has 7 possibilities from (0, 1, 2, ..., 6, 7, 8, 9)
        //... and so on
        private int calcCardinality(String number){
            bool[] digitSeen = new bool[10];
            int cardinality = 1;
            int possibleNumbers = 10; // [0, 1, ..., 8, 9]
            for (int i = 0; i < number.Length; i++){
                int digit = number[i] - '0';
                if (!digitSeen[digit]){
                    // we see this digit for the first time
                    digitSeen[digit] = true;
                    if (i == 0) cardinality *= possibleNumbers - 1; // the
                    first digit mustn't be zero
                    else cardinality *= possibleNumbers;
                    possibleNumbers--;
                }
            }
            return cardinality;
        }
    }
}
```



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