1386 – Jaguar King

In a deep forest, a war is going to begin. Like other animals, the jaguars are preparing for this ultimate battle. Though they are mighty strong and lightening fast, they have an extra advantage over other animals. It's their wise and brave king - 'The Jaguar King'.

The king knows that only speed and strength is not enough for winning the war. They have to make a perfect formation. The king has set up a nice formation and placed all the jaguars according to that formation. There are **N** jaguars (including the king). The king is marked by **1** and the other jaguars are marked by a number from **2** to **N**. There are **N** positions numbered from **1** to **N**, and initially the jaguars are positioned as their number i.e. the $\mathbf{i}^{th}$ jaguar is in $\mathbf{i}^{th}$ position.

But then the king realizes that to make the formation perfect and effective, some positions should have stronger jaguars and some should have faster jaguars. Since the strength and speed of all the jaguars are not same, the king decided to change the positions of some jaguars. The wise king knows the ability of each and every jaguar, so his decision is perfect but the problem is how to change the position of the jaguars.

One of the wise jaguars has given an idea. The idea is simple. All the jaguars will wait for the king's signal, all eyes upon the king. Suppose the king is in the $\mathbf{i}^{th}$ position. The king jumps to $\mathbf{j}^{th}$ position and when the jaguar at $\mathbf{j}^{th}$ position sees the king coming, he immediately jumps to $\mathbf{i}^{th}$ position. The king repeats this procedure until they are formatted like the new formation. And collision will never occur in the jumping procedure.

If the king is in the $\mathbf{i}^{th}$ position,

a. if **i** modulo 4 is 1, the king can jump to position **(i+1), (i+3), (i+4), (i-4)**
b. if **i** modulo 4 is 2, the king can jump to position **(i+1), (i-1), (i+4), (i-4)**
c. if **i** modulo 4 is 3, the king can jump to position **(i+1), (i-1), (i+4), (i-4)**
d. if **i** modulo 4 is 0, the king can jump to position **(i-3), (i-1), (i+4), (i-4)**

And assume that the king always jumps to a valid position i.e. position between **1** and **N**.

Now you are given the final formation of the jaguars, your target is to find the minimum number of times the king has to jump to gain the new formation.

Input

Input starts with an integer **T (≤ 50)**, denoting the number of test cases.

Each case starts with a line containing an integer **N (4 ≤ N ≤ 20, N is a multiple of 4)**. The next line contains **N** integers, which is a permutation of **1** to **N**, denoting the final formation of the jaguars. The $\mathbf{i}^{th}$ integer denotes the jaguar which should be placed to $\mathbf{i}^{th}$ position.

Output

For each case, print the case number first. Then if it's impossible to do so, print **'impossible'**. If it's possible to do so, but not with in 25 jumps, print **'impossible in 25 jumps'**. Otherwise, print the minimum number of times the king has to jump to gain the new formation.

Sample Input	Output for Sample Input
8 4 1 2 3 4 4 4 2 3 1 8 5 2 3 4 8 6 7 1 8 5 2 8 3 6 7 1 4 4 4 1 3 2 8 8 1 4 3 6 7 5 2 12 12 2 4 1 10 9 7 8 5 6 3 11 12 1 3 12 10 4 6 7 8 5 9 2 11	Case 1: 0 Case 2: 1 Case 3: 2 Case 4: 7 Case 5: impossible Case 6: 15 Case 7: 25 Case 8: impossible in 25 jumps