Buying Integers

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Let's assume that you have **n** integers, $\mathbf{A_1}$, $\mathbf{A_2}$, $\mathbf{A_3}$ … $\mathbf{A_n}$

Let's define,

E = Number of pairs **(i,j)** such that **i<j** and **($\mathbf{A_i + A_j}$)** are even .

O = Number of pairs **(i,j)** such that **i<j** and **($\mathbf{A_i + A_j}$)** are odd .

D = | **E-O** |

That means, **D = (E-O)** if **(E-O) ≥ 0 , -(E-O)** otherwise .

Unfortunately, you do have **n** but those **n** integers are lost . You will have to buy them again. Before going to the market, you have decided that you will buy **n** integers in such a way that the value of **D** will be as small as possible, as you will have to pay **D** golden coins, to buy them.

Now,you are wondering, what that minimum **D [**Let's say it $\mathbf{D_{min}}$**]** will be .

Input

First line of the input file will contain the number of test cases, **T ≤ 1000000**, followed by **T** lines, each containing an integer **n** (**1** ≤ **n** ≤ $\mathbf{10^9}$) .

Output

For each case, print the case number starting from 1 and $\mathbf{D_{min}}$ for the value of **n** in that particular case. See the sample output for exact formatting.

Sample Input	Output for Sample Input
3 3 4 5	Case 1: 1 Case 2: 0 Case 3: 2

Warning : Input file is huge, please use faster input and output methods (e.g. printf and scanf in C++) .

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