

## 6906 Cluster Analysis

Cluster analysis, or also known as clustering, is a task to group a set of objects into one or more groups such that objects belong to a same group are more similar compared to object in other groups. In this problem, you are given a set of  $N$  positive integers and an integer  $K$ . Your task is to compute how many clusters are there in the given set where two integers belong to a same cluster if their difference is no larger than  $K$ .

For example, let there be a set of  $N = 7$  positive integers: 2, 6, 1, 7, 3, 4, 9, and  $K = 1$ .

Based-on the cluster definition of  $K$ , we know that:

- 2 and 1 belong to a same cluster (the difference is no more than  $K = 1$ ),
- 2 and 3 belong to a same cluster,
- 6 and 7 belong to a same cluster,
- 3 and 4 belong to a same cluster.

From these observations, we can conclude that there are 3 clusters in this example:  $\{2, 1, 3, 4\}$ ,  $\{6, 7\}$ , and  $\{9\}$ .

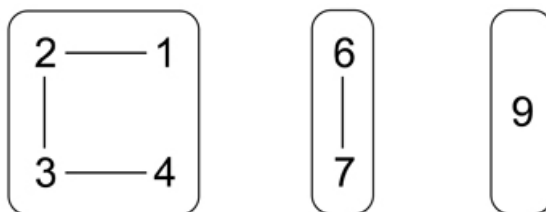


Figure 1.

Figure 1 illustrates the clustering result. A line connecting two numbers means that those two numbers should belong to a same cluster according to the definition.

### Input

The first line of input contains an integer  $T$  ( $T \leq 100$ ) denoting the number of cases. Each case begins with two integers in a line:  $N$  and  $K$  ( $1 \leq N \leq 100$ ;  $1 \leq K \leq 1,000,000$ ) denoting the set size and the clustering parameter respectively. The next line contains  $N$  integers  $A_i$  ( $1 \leq A_i \leq 1,000,000$ ) representing the set of positive integers. You are guaranteed that all integers in the set are unique.

### Output

For each case, output 'Case # $X$ :  $Y$ ', where  $X$  is the case number starts from 1 and  $Y$  is the number of cluster for that particular case.

#### Explanation for 2nd sample case:

The given set is exactly the same as in 1st sample, however, now  $K = 2$ . With two additional observations (compared to 1st sample): 4 and 6 are in the same cluster, 7 and 9 are in the same cluster; all those integers will be in the same cluster.

#### Explanation for 3rd sample case:

There are 2 clusters:  $\{1, 4\}$ , and  $\{15, 20, 17\}$ .

#### Explanation for 4th sample case:

In this sample, all integers will be in their own cluster.

**Sample Input**

```
4
7 1
2 6 1 7 3 4 9
7 2
2 6 1 7 3 4 9
5 5
15 1 20 4 17
8 10
100 200 300 400 500 600 700 800
```

**Sample Output**

```
Case #1: 3
Case #2: 1
Case #3: 2
Case #4: 8
```