

Problem 4: Lenny's Lucky Lotto Lists

Lenny likes to play the game of lotto. In the lotto game, he picks a list of N unique integers in the range from 1 to M . If his list matches the list of N integers that are selected randomly, he wins.

Lenny has a scheme that he thinks is likely to be lucky. He likes to choose his list so that each integer in it is at least twice as large as the one before it. So, for example, if $N=4$ and $M=10$, then the possible lucky lists Lenny could like are:

```
1 2 4 8
1 2 4 9
1 2 4 10
1 2 5 10
```

Thus Lenny has four lists from which to choose.

Your job, given N and M , is to determine from how many lucky lists Lenny can choose.

Input

There will be multiple cases to consider. The input for each is a pair of integers giving values for N and M , in that order. You are guaranteed that $1 \leq N \leq 10$, $1 \leq M \leq 2000$, and $N \leq M$. The input for the last case will be followed by a pair of zeroes.

Output

For each case display a line containing the case number (starting with 1 and increasing sequentially), the input values for N and M , and the number of lucky lists meeting Lenny's requirements. The desired format is illustrated in the sample shown below.

Sample Input

```
4 10
2 20
2 200
0 0
```

Output for the Sample Input

```
Case 1: n = 4, m = 10, # lists = 4
Case 2: n = 2, m = 20, # lists = 100
Case 3: n = 2, m = 200, # lists = 10000
```