

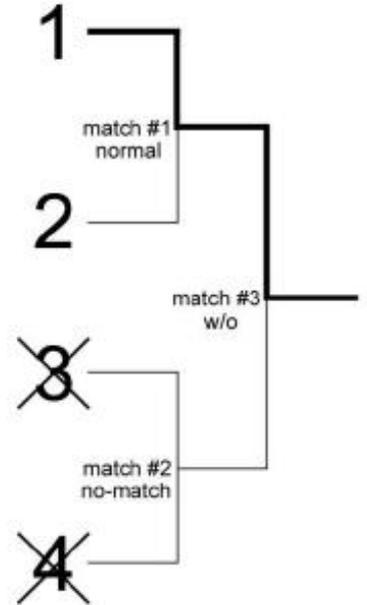
## 1241 Jollybee Tournament

In Jollybee Chess Championship 2008, there are a number of players who have withdrawn themselves from the championship of 64 players (in this problem, we generalized it into  $2^N$  players). Due to the nature of the competition, which is a regular knock-out tournament, and also the short notice of the withdrawals, some matches had been walkover matches (also known as a w/o, a victory due to the absent of the opponent).

If both players are available then there will be a normal match, one of them will advance to the next phase. If only one player is available then there will be a walkover match, and he/she will automatically advance. If no player is available then there will be no match.

In the right figure, the player #3 and #4 are withdrawn from the tournament, leaving a total of one w/o match (at match #3).

Given the list of players who withdraw right before the tournament start, calculate how many w/o matches to happen in the whole tournament, assuming that all of the remaining players play until the end of the tournament (winning or knocked-out).



### Input

The first line of input contains an integer  $T$ , the number of test cases to follow. Each case begins with two integers,  $N$  ( $1 \leq N \leq 10$ ) and  $M$  ( $0 \leq M \leq 2^N$ ). The next line contains  $M$  integers, denoting the players who have withdrawn themselves right before the tournament. The players are numbered from 1 to  $2^N$ , ordered by their position in the tournament draw.

### Output

For each case, print in a single line containing the number of walkover matches.

### Sample Input

```
3
2 2
3 4
3 5
1 2 3 4 5
2 1
2
```

### Sample Output

```
1
2
1
```