Balance Weights

We want to measure the weight of target object only using a balance scale and counterweights. We put the target object on a dish of balance scale and try to get the balanced state by putting up some counterweights onto the other dish. Suppose that we are given 4 counterweights of {1, 5, 6, 9} gram. Then we can measure the weights of {1, 5, 6, 7, 9, 10, 11, 12, 14, 15, 16, 20, 21} by selecting some subsets of counterweights {1, 5, 6, 9}.

For example we can measure 15 grams by selecting {1, 5, 9}. But we cannot measure 19 grams from the set of counterweights {1, 5, 6, 9 }. So we need one more extra counterweight if we want to all integer weights 1 gram to 21 grams.

The task of this problem is to measure all weights between 1 to K grams using the counterweights given. The counterweights and the integer K will be given in each testing case. If you can measure all weights 1 to K grams with the initial counterweights, that's OK. We do not need any more additional counterweights. If it is impossible to measure all weights from 1 to K, we have to add one more counterweight to complete the task. If one additional extra counterweights makes the task possible, then you must compute the minimal weight of such the extra weights. If adding only one extra counterweight does not allow us to measure weights from 1 to K, you should report this.

[Input]
The first line of input file gives T, the number of testing cases. Note that T ≤ 100. The first line of each testing case gives two integers, N and K. N denotes the number of counterweights given and K is the maximal weight (gram) we have to measure. Then the weights of N counterweights, u_i will be given in the next line in the increasing order. Note that all the weights of counterweights are unique ($u_i \neq u_j$) where $1 \leq u_i \leq 100$. Also the weight sum of the counterweights may be larger than K. Two testing data sets are prepared as:

- Set 1: $1 \leq N \leq 20, 1 \leq K \leq 500$.
- Set 2: $21 \leq N \leq 50, 1 \leq K \leq 5000$

[Output]
You should print '0'(zero) if we can measure all weights between 1 to K grams using only the counterweight given. Otherwise, if not possible, you can add one extra counterweight 'u_+'. In this case, the weight of extra counterweight should be minimized if more than one extra counterweights are available. You should note that the weight of the extra counterweight should be different to counterweights initially given. ($u_+ \neq u_i$). This implies that all counterweights in this task are unique. If one extra counterweight does not allow to measure 1 to K grams, you should report this by printing '-1'. And note that the weight of extra counterweight can be larger than 100.

[Example]
Input

```
3                  // 3 testing cases are given.
5  30                   //   N=5 (No. of counterweights),   K=30 (max. weight to measure)
1 2 4 8 16          // weights of 5 counterweights initially given.
4 30                //   the second test case, 4 counterweights, K=30
```

```
1 2 8 17
5 30                //   the third testing case, 5 counterweights and K=30
1 2 4 7 18
```

Output

```
0          // we can measure 1 to 30 grams without any extra weights.
-1         //   impossible by adding at most one extra counterweight
3          // Two extra counterweights 3 and 8 make the task possible.
           // but you should report 3 since 3 < 8.
```