200 Level Problems

CUPCAKES

The < ColgateCoders > are organizing **Colgate Cupcakes and Coding 2020**. Megan has placed an order of N cupcakes. Brittney's task, as the cupcake incharge, is to place the cupcakes into bags each of capacity C. Each bag should have exactly C cupcakes. If there are leftover cupcakes that do not fill, she gets to eat them. Brittney really likes *Flour & Salt* cupcakes. Help her find the ideal bag capacity that will maximize the number of cupcakes she gets to eat.

Input Format

1. The first line contains an integer $1 \leq T \leq 500$.
2. The following T lines contain integers $N_1, N_2, \ldots, N_T$ where each integer is less than 100,000.

Output Format

For each N_i, print out the bag capacity C that maximizes the number of cupcakes Brittney gets to eat. Each capacity should be on its own line. For each N_i, the corresponding capacity C_i should not exceed N_i.

Sample Input

```
3
3
5
2
```

Expected Output

```
2
3
2
```

Explanation

There are 3 Test cases here ($T = 3$). For the first case, if there are 3 cupcakes and a bag of capacity 2, Brittney will fill up the first bag with 2 cupcakes, but the remaining cupcake is insufficient to fill up the rest, so she gets to eat it. This is the largest number of cupcakes she gets to keep since the other choices are bags of capacity 1 or 3, which wouldn't allow her to keep any. Similarly, for an order of 5 cupcakes, using bags of capaciy 3 yields 2 leftover cupcakes. Note for the last case, there are 2 cupcakes, so the two options for bag capacity are 1 and 2, both of which leave Brittney with no cupcakes.

When there are multiple bag capacities that allow the maximum number of leftover cupcakes, choose the largest number.

For 25 points...

Use **test1.in** as your test input, your output should match **test1.out**.

Reflections

Given a string with **distinct lowercase alphabetical letters** with no spaces such as abcdefg, define a reflection of a letter in the string c as moving it (without changing the order of any other letter) to a new place in the string such that the number of letters originally to the right of it is now the number of letters to the left of it.

Reflecting the character e in $myfriend$ would form the string $myefrind$. Here are some more examples:

1. word= abcd char=c output = acbd
2. word= fz char=z output = zf
3. word= colgate char=g output = colgate
4. word= q char=q output = q
5. word= cup char=c output = upc
6. word= cakes char=a output = ckeas

Input

Input Format: First line is an integer $1 \leq T \leq 200$ that denotes the number of test cases. The following T lines contain a string and a character separated by a space.

Output

Output Format: Print the reflected string on a separate line for each of the test cases.

Sample Input/Output File

INPUT:
3
abcd c
cup c
cakes a
OUTPUT:
acbd
upc
ckeas

For 25 more points...

Test your program with test2.in and compare against test2.out.