CS1020E | Lab 4 | Exercise 3 (will not be graded)

Josephine

Objective

The objective of this exercise is to learn how to implement and use a **Circular Linked List**.

Problem Description

Josephine is a beautiful princess. She's so beautiful that there are *N* princes proposing to her (needless to say, *N* could be as large as 100). After lots of consideration, Josephine and her parents realized that all these princes are perfect, so that it is impossible to choose one and reject the others with a good reason. They decided that Josephine would not reject the one chosen by Fate, while other princes could not ask for a fairer decision.

The *N* princes, numbered from 1 to *N*, are asked to stand in a circle. Our beautiful princess would choose a random number *K* and begin to find her fiancé with that number. Starting from the first person, she counted to *K*, and removed that *K*-th person from the circle. Then, she starts counting from the next person and removes the *K*-th person. This process is repeated until all candidates are removed but The Chosen One.

Everything has been prepared, except one minor problem. To be sure that the processes are random enough, Josephine chose a large number *K* (around 100). As the result, counting and removing one princess after another would be a painful process. She leaves this work to you — the Royal Programmer.

Given *N* and *K*, your program should print out the numbers of the princes, in the order in which they are removed from the circle. The last number would be The Chosen One.

Add your code only to the parts of the files indicated. Do not modify any other part of the given code, and do not add new files.

Inputs

The first line consist of *T*, the number of test cases, where 1 <= *T* <= 100. The following *T* lines specify the *T* test cases, each line containing two integers, *N* and *K*.

Outputs

One line for each test case consists of the princes' numbers in the order they are removed. For each output number, it is followed by a whitespace (that means there is a white space after the last printed number of each line).

Sample Input

```
2
3 1
4 2
```

Sample Output

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

Explanation

Test case 1:

- Starting from 1. Stop and remove 1.
- Starting from 2. Stop and remove 2.
- Only 3 is left as The Chosen One.

Test case 2:

- Starting from 1, count to 2. Stop and remove 2.
- Starting from 3, count to 4. Stop and remove 4.
- Starting from 1, count to 3. Stop and remove 3.
- Only 1 is left as The Chosen One.

Submission

You need to submit **ALL** your completed skeleton **`*.cpp`** and **`*.h`** files to CodeCrunch (https://codecrunch.comp.nus.edu.sg/).

Your submission for this exercise will not be manually graded, and there is no submission deadline for this exercise.