

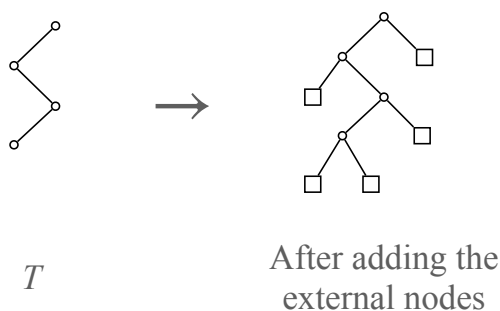
Problem F

The Secrete Map

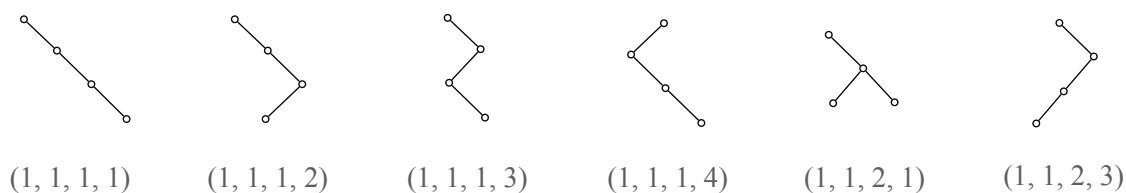
Time limit: 1 second

A treasure hunter H has a secrete message, with which he knows that the treasure is hidden in a cave. There are branches in the cave, so it is impossible to reach the treasure without a map. Fortunately, from the secrete message he knows that the routes in the cave form a **binary tree**, with the entrance being the root. However, there is no tree structure given in the message, but two numbers n and r . He asks a computer scientist Professor W for help. After a few days of investigation, Professor W tells H that n is the number of nodes in the binary tree, and r is the order of the tree in a specific ordering. The order r is the lexicographic order of an encoding of the n -node binary tree. The encoding of a binary tree T is defined as follows. First, add children, called **external nodes**, to all the nodes so that the root has degree 2 and every non-root node has degree 3. For each node of T , mark it by the number of external nodes in its **left subtree**. The encoding of T is an integer sequence resulting from an **inorder traversal** of T .

For example, there is a 4-node binary tree given in the left of the following figure. After adding the external nodes, we have the tree on the right side. Traversing T using inorder traversal, we have a sequence (1, 1, 2, 4). This is the 7th 4-node binary tree, so in the secrete message the two given numbers are 4 and 7.



The first six 4-node binary trees are given in the following figure.



Given n and r , write a program to find the encoding of the corresponding tree.

Input File Format

The first line is a positive integer N , $N \leq 10$, which is the number of test cases. For each test case, the input has only one line, containing two positive integers n and r , with $1 \leq n \leq 15$ and $r \leq 10^6$. It is guaranteed that r is less than or equal to the number of n -node binary trees. The two numbers are separated by a space.

Output Format

N lines, which are the outputs of the test cases in the given order. For each test cases, the output has one line, containing n integers, which is the encoding of the r th n -node binary tree. Consecutive integers are separated by a space.

Sample Input

```
2
4 7
5 42
```

Output for the Sample Input

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