Test Case

Please test your program with Input, and then check the answers with Output.

Listing 10 : Insert and delete a number of binary search tree

```
Input：
4 5 1 0 6 7 2
insert(44)
delete(6)
insert(3)
delete(2)

Output：
4 1 5 0 3 7 44
```

11. Heap sort

Given a sequence of n numbers, build a heap using an array and implement a heap sort that results in a sorted numbers in ascending order. The output includes two lines of the results: (1) the contents of the array that stores the heap in each step, and (2) the sorted numbers in ascending order.

Test Case

Please test your program with Input1 and Input2, and then check the answers with Output1 and Output2.

Listing 11: Heap sort

```
Input1：
1 4 5 0 6 7 2

Output1：
0 1 2 4 6 7 5
1 4 2 5 6 7
2 4 7 5 6
4 5 7 6
5 6 7
6 7
7
0 1 2 4 5 6 7
```

```
Input2：
3 7 5 9 1

Output2：
1 3 5 9 7
3 7 5 9
5 7 9
7 9
9
1 3 5 7 9
```

12. Equivalent Relations

Given *n* equivalent relations, find the equivalent classes. Each line in the input shows the equivalent relation that consists of a pair of numbers separated by a space. Each line in the output is an equivalent class.

Note: You must sort each equivalent class in ascending order, and print the equivalent classes based on the smallest number of each class in ascending order.

Test Case

Please test your program with Input1 and Input2, and then check the answers with Output1 and Output2.

Listing 12: Equivalent Relations

```
Input1：
0 4
3 1
6 10
8 9
7 4
6 8
3 5
2 11
11 0

Output1：
0 2 4 7 11
1 3 5
6 8 9 10
```