

Q10.

In this problem, you need to implement a heap sort algorithm.

You must use the template to do this lab.

DO NOT use any sort functions from the standard or other libraries.

If you use other ways to sort, your score will be 0.

Input Format

After reading the load command, a sequence of integers will follow on the same line. These values should be directly inserted into a vector.

You will then be instructed to build a **min-heap** using either the **build_bottomup** or **build_topdown** method.

Finally, the sort command will appear, requesting you to perform heap sort on the current heap and output the sorted result.

All values are guaranteed to be unique.

Input

```
load 3 -5 7 1 0 -4 8
build_bottomup
sort
```

```
load 3 -5 7 1 0 -4 8
build_topdown
sort
```

```
load 5 9 3 8 1 0
build_bottomup
sort
```

```
load 5 9 3 8 1 0
build_topdown
sort
```

Output

```
-5 -4 0 1 3 7 8
```

-5 -4 0 1 3 7 8
0 1 3 5 8 9
0 1 3 5 8 9