Algorithm 1: BubbleDown

Input: Input
Output: Output

```
1  Procedure BubbleDown(A, i, n)
2  |  largest ← i
3  |  left ← 2 * i + 1
4  |  right ← 2 * i + 2
5  |  if left < n ∧ A[largest] < A[left] then
6  |  |  swap A[largest] and A[left]
7  |  if right < n ∧ A[largest] < A[right] then
8  |  |  swap A[largest] and A[right]
9  |  if i ≠ largest then
10 |  |  swap A[largest] and A[i]
11 |  |  BubbleDown (A, largest, n)
```

Algorithm 2: BuildMaxHeap

Input: Input
Output: Output

```
1  Procedure BuildMaxHeap(A)
2  |  for i ← ⌊n/2⌋ to 0 do
3  |  |  BubbleDown (A, i, n)
4  |  end
```

Algorithm 3: HeapSort

Input: Input
Output: Output

```
1  Procedure HeapSort(A)
2  |  BuildMaxHeap (A, n)
3  |  for i ← n − 1 to 0 do
4  |  |  swap A[0] and A[i]
5  |  |  BubbleDown (A, 0, i)
6  |  end
```