

Trace Dijkstra's SSSP algorithm from node A on the graph with weights below. Show distance, parent, in-PQ? values each time a node has been removed from the priority-queue.

	B	C	D	E	F	G
A	8	8	9	13	4	11
B		0	9	12	1	18
C			3	7	15	6
D				1	13	9
E					18	6
F						5

distance							parent							in-PQ?						
A	B	C	D	E	F	G	A	B	C	D	E	F	G	A	B	C	D	E	F	G
0	-	-	-	-	-	-	A	-	-	-	-	-	-	+	-	-	-	-	-	-

Assume array H contains keys 1 to 10 in descending order. Trace the execution of the code below.

```
for j in range(1,n):
    bubbleup(j)
```

Repeat the above question for this code.

```
for j in range(4,-1,-1):
    trickledown(j)
```

You build a heap with $n = 2^t - 1$ keys by executing trickledown as above. The index of the root is 0. What is the index of the last array position? What are the indices, and in what order, over which you call trickledown? For $t = 3$, give the worst-case total number of key comparisons. For arbitrary t , as a sum, give the worst-case total number of key comparisons.