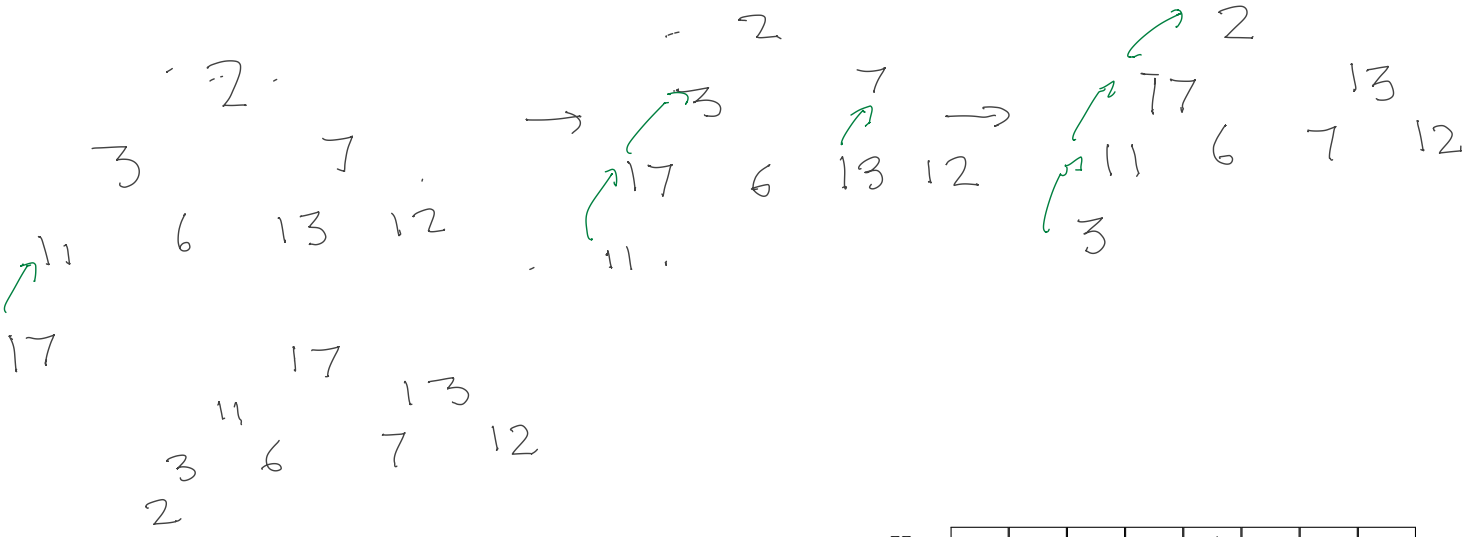
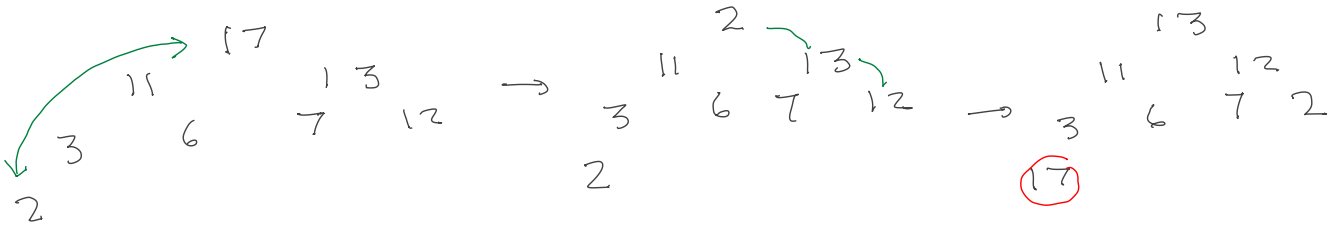
CIS 3223 TMQ 6 | **Name:**

Dr Anthony Hughes | **Temple ID (last 4 digits:**

1 (8 pts) Consider the array $H = [2, 3, 7, 11, 6, 13, 12, 17]$ of integers. For heapsort implemented using a binary tree, what is H after it has been heapified and one cycle of heapsort has been completed.



$H =$ | 17 | 11 | 13 | 3 | 6 | 7 | 12 | 2 |



$H =$ | 13 | 11 | 12 | 3 | 6 | 7 | 2 | **17** |

2 (**extra credit**, 2 pts) Consider a node at position j, $j \geq 2$, in a complete 4-ary tree.

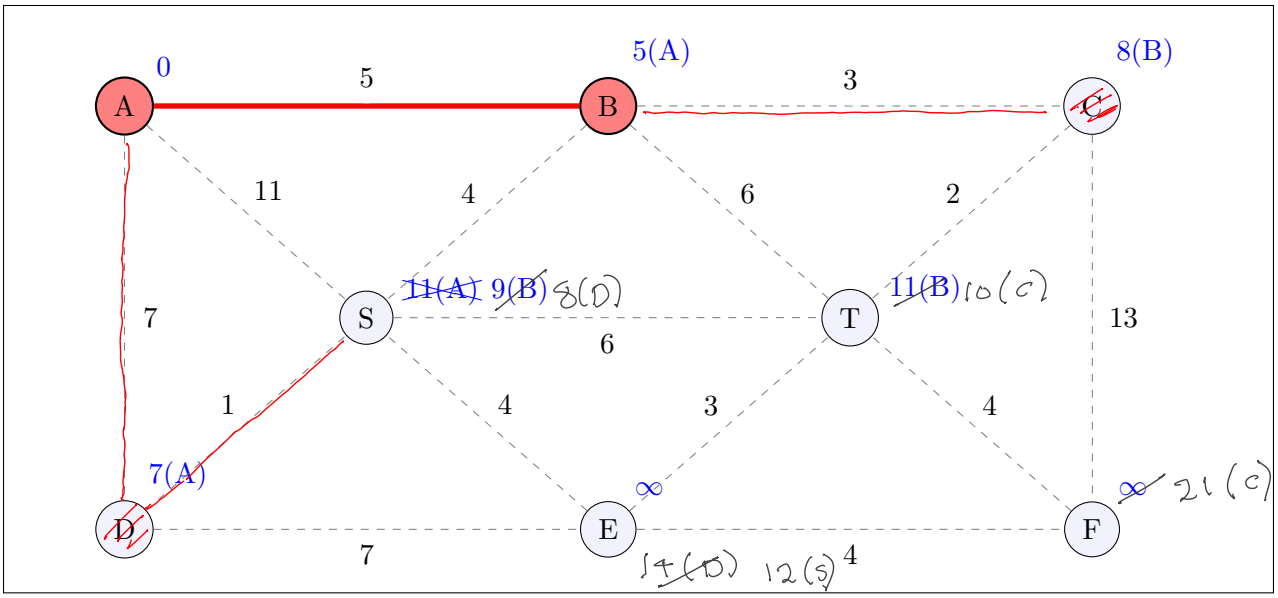
What is the position of the rightmost child of the node? $2j+1$

What is the position of the parent of the node? $\lceil \frac{j-1}{4} \rceil$

Question 3 on back.

3 12 pts) Run the first 5 steps of Dijkstra's algorithm starting at A. The first two steps have been completed. Show updates on graph.

List the 5 vertices deleted: A B ____ ____ ____



1 `deletemin` → `A` Children of A updated: cost(B) = 5, cost(D) = 7,cost(S) = 11

2 `deletemin` → `B` AB added to tree
Children of B updated: cost(C) = 8, cost(S) = 9, cost(T) = 11

3 `deletemin` → D AD added to tree
children of D updated
cost(E) = 14, cost(S) = 8

4 `deletemin` → C BC added to tree
children of C updated
cost(F) = 21, cost(T) = 10

5 `deletemin` → S children of S updated
cost(E) = 12