

## Part 4 - Heaps

CSCI 104 - Devin C. Martin

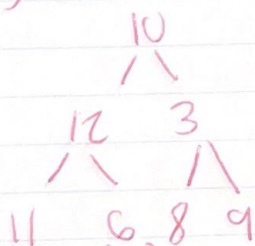
a)

BuildHeap Process on  $[10, 12, 3, 11, 6, 8, 9]$

Initial Array as a Binary Tree

Array:  $[10, 12, 3, 11, 6, 8, 9]$

Binary Tree



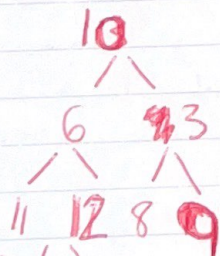
After Heapify(2)

No Change (subtree rooted at 3 is already a min-heap)

After Heapify(1)

Array Now:  $[10, 6, 3, 11, 12, 8, 9]$

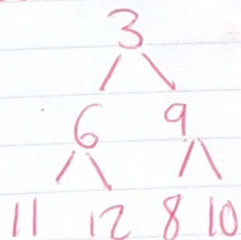
Binary Tree:



After Heapify(0)

Array Now:  $[3, 6, 9, 11, 12, 8, 10]$

Binary Tree:



b)

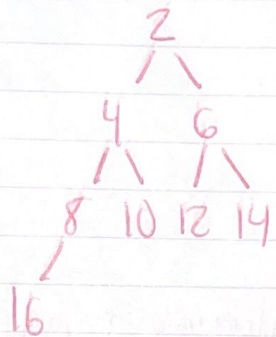
Operations on [2, 4, 6, 8, 10, 12, 14, 16]

In

Initial Configuration

Array [2, 4, 6, 8, 10, 12, 14, 16]

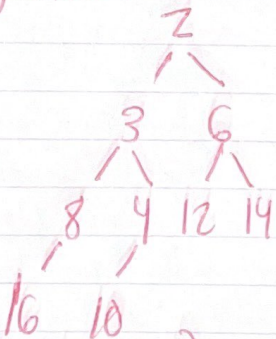
Binary Tree:



Insert 3

Array Now: [2, 3, 6, 8, 4, 12, 14, 16, 10]

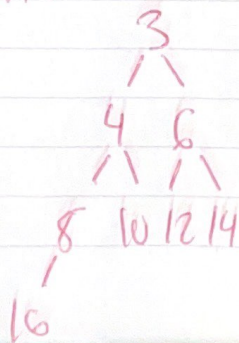
Binary Tree:



Pop(Top element)

Array Now: [3, 4, 6, 8, 10, 12, 14, 16]

Binary Tree:

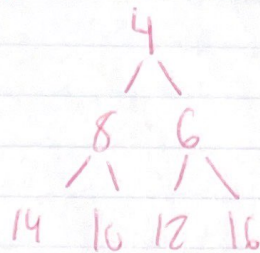




Pop(Top Element)

Array Now: [4, 8, 6, 14, 10, 12, 16]

Binary Tree:



Insert 5

Array Now: [4, 5, 6, 8, 10, 12, 16, 14]

Binary Tree:

