#### Aru Poleo Lab

## Reflection

Regarding the P.Q from slide 11, the program outputs as follows:

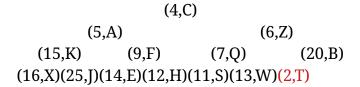
# Output from reflection binary:

(4,C) (5,A)(6,Z) (15,K)(9,F)(7,Q)(20,B) (16,X)(25,J)(14,E)(12,H)(11,S)(13,W) (2,T) (5,A)(4,C) (15,K)(9,F)(7,Q)(6,Z) (16,X)(25,J)(14,E)(12,H)(11,S)(13,W)(20,B)

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Let us go one step at a time to see if the produced output is correct

## *Step 1*: Insertion at bottom:



Step 2: Check against parent. 20>2. Swap

Step 3: Check against parent. 6>2. Swap

Step 4: Check against parent. 4>2. Swap

# Comparison

$$(2,T) & \textit{Manual Output} \\ (5,A) & (4,C) \\ (15,K) & (9,F) & (7,Q) & (6,Z) \\ (16,X)(25,J)(14,E)(12,H)(11,S)(13,W)(20,B) & \textit{Actual Output} \\ (5,A) & (4,C) \\ (15,K) & (9,F) & (7,Q) & (6,Z) \\ (16,X)(25,J)(14,E)(12,H)(11,S)(13,W)(20,B) & & & & \\ \end{cases}$$

The output is proven to thus be correct, let us do the same with the P.Q from slides 18

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(4,C)
                                                                 Pre-min_remove()
(5,A)(6,Z)
(15,K)(9,F)(7,Q)(20,B)
(16,X)(25,J)(14,E)(12,H)(11,S)(13,W)
(5,A)
                                                                 Post-min_remove()
(9,F)(6,Z)
(15,K)(12,H)(7,Q)(20,B)
(16,X)(25,J)(14,E)(13,W)(11,S)
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                    (4,C)
                                                                 Pre-min_remove()
         (5,A)
                               (6,Z)
              (9,F)
   (15,K)
                          (7,Q)
                                   (20,B)
(16,X)(25,J)(14,E)(12,H)(11,S)(13,W)
                    (5,A)
                                                                 Post-min_remove()
         (9,F)
                               (6,Z)
   (15,K)
                                   (20,B)
              (12,H)
                          (7,Q)
(16,X)(25,J)(14,E)(13,W)(11,S)
Step-by-step
Step 1: Removal of min and movement of last Entry to the front.
                    (13,W)
                               (6,Z)
         (5,A)
   (15,K)
              (9,F)
                          (7,Q)
                                   (20,B)
(16,X)(25,J)(14,E)(12,H)(11,S)
                                                                 Return: (4,C)
Step 2: Check against both right and left child Entries. 13>5 && 13 > 6
                    (13,W)
         (5,A)
                               (6,Z)
                          (7,Q)
   (15,K)
              (9,F)
                                   (20,B)
(16,X)(25,J)(14,E)(12,H)(11,S)
```

Step 3: Check both child Entried against each other. 5<6. Swap with (5,A)

Step 4: Check against both right and left child Entries. 13<15 && 13>9. Swap with (9,F)

**Step 4:** Check against both right and left child Entries. 13<14 && 13>12. Swap with (12H)

### Comparison: