CSE 326 Selected Practice Problem Solutions

2.6 As discussed in class, the answer to the first part is $2^{2^{N-1}}$ and the answer to the second part is $O(\log \log D)$.

2.10

(a) $O(N)$

(b) $O(N^2)$

(c) The answer depends on how many digits past the decimal point are computed. Each digit costs $O(N)$.

3.22 Pseudocode:

```
Create stack
Read in first token
while (token is not "=")
   if (token is a number)
      push the token onto the stack
   else
      if (token is "+")
         pop a
         pop b
         push a + b
      if (token is "-")
         pop a
         pop b
         push a − b
      if (token is "*")
         pop a
         pop b
         push a ∗ b
      if (token is "/")
         pop a
         pop b
         push a/b
   read next token
```

4.1

(a) A.

(b) G, H, I, L, M, and K.

4.8

(a) - * * a b + c d e.

(b) ((a * b) * (c + d)) - e.

(c) a b * c d + * e -.

4.27 See Figures 1-4.

Figure 1: 4.27 After accessing 3

4.28 See Figure 5.

Figure 2: 4.27 After accessing 9

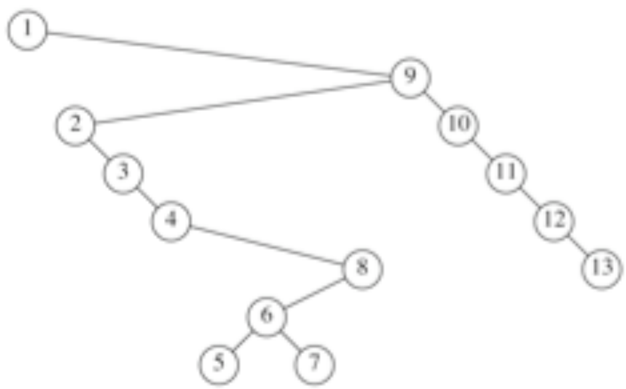

Figure 3: 4.27 After accessing 1

6.2 See Figure 6.

6.3 The result of three $deleteMins$, starting with both of the heaps in Exercise 6.2, is in Figure 7.

6.30 Clearly the claim is true for $k = 1$. Suppose it is true for all values $i = 1, 2, \ldots, k$. A B_{k+1} tree is formed by attaching a B_k tree to the root of a B_k tree. Thus by induction, it contains a B_0 through B_{k-1} tree, as well as the newly attached B_k tree, proving the claim.

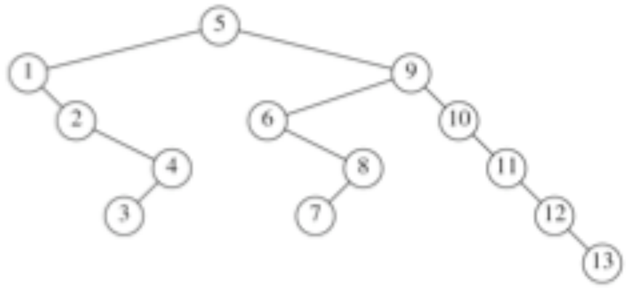

Figure 4: 4.27 After accessing 5

Figure 5: 4.28

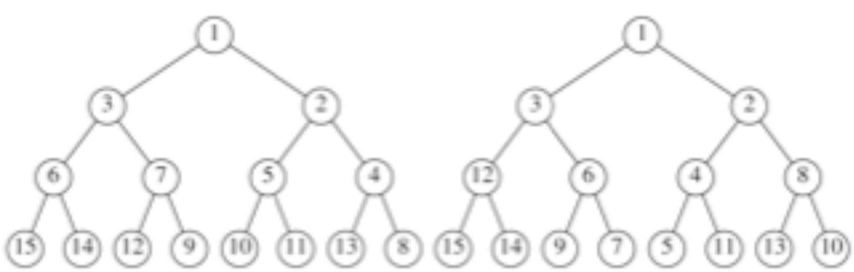

Figure 6: 6.2

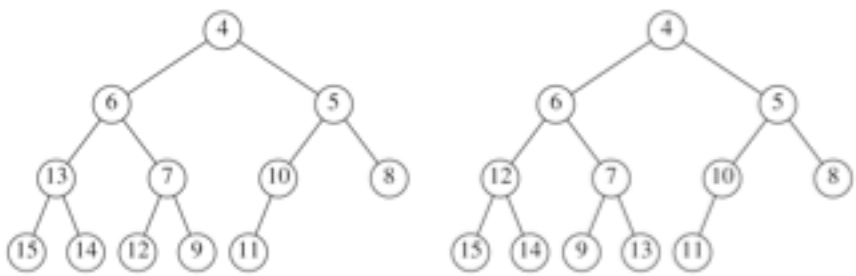

Figure 7: 6.3