CS 260: Homework 4

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1 1

1.1 a

Leaf nodes: D, M, N, F, J, K, L

1.2 b

Root node: A

1.3 c

Parent node of C: A

1.4 d

Node C's children: F, G, H

1.5 e

Node ancestors of E: B, A

1.6 f

Node descendants of E: I, M, N

1.7 g

Right siblings of D and E: none

1.8 h

Nodes to the left or right of G: J and K

1.9 i

Depth of node C: 1

1.10 j

Height of node C:2

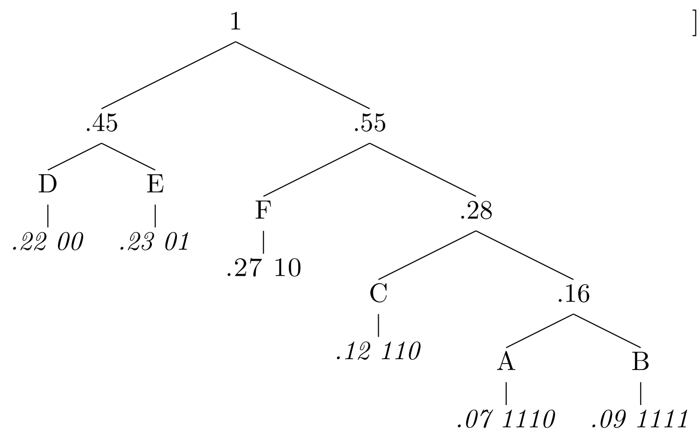
2 2

1: B E I
2: E I N
3: E I M
4: C H L
5: C G K
6: C G J

3 3

	pr(n) < pr(m)	in(n) < in(m)	po(n) < po(m)
n is to the left of m	✓	✓	✓
n is to the right of m	✓		✓
n is a proper ancestor of m	✓	✓	
n is a proper descendant of m		✓	✓

4 4



5 5

A tree with n nodes would have a maximum height of n-1 trees to take the root into account.

0-1 nodes have a height of 0, 2-3 nodes have a height of 1, 4-7 nodes have a height of 2...so for a binary tree, the minimum height will be $\log_2(n)$.

6 6

With similar logic above, the maximum height will still be n-1 height for n nodes. The minimum height will be $\log_b(n)$ for n nodes with b number of children.