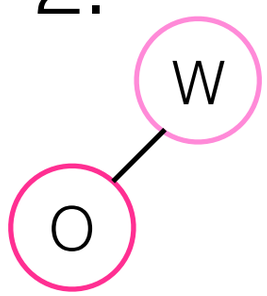
Theory Question 1 a)

INSERT: W O E C A L H

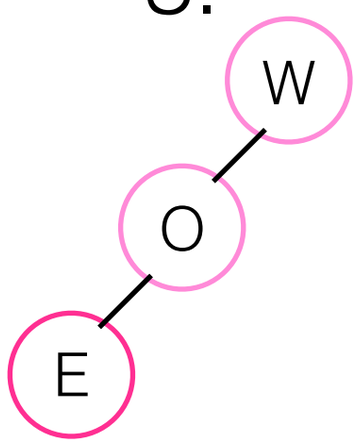
1 2 3 4 5 6 7

1.

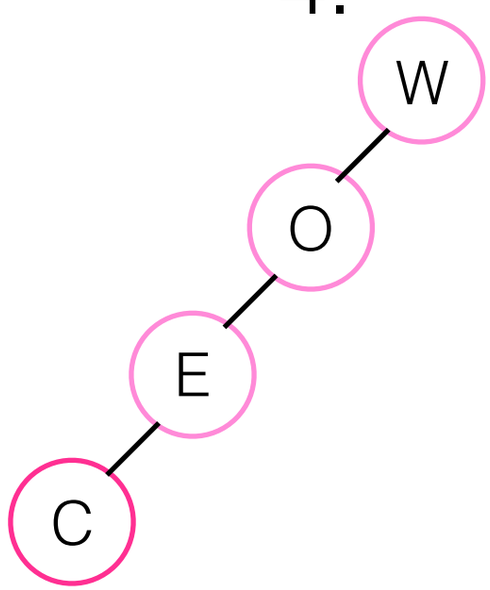
2.



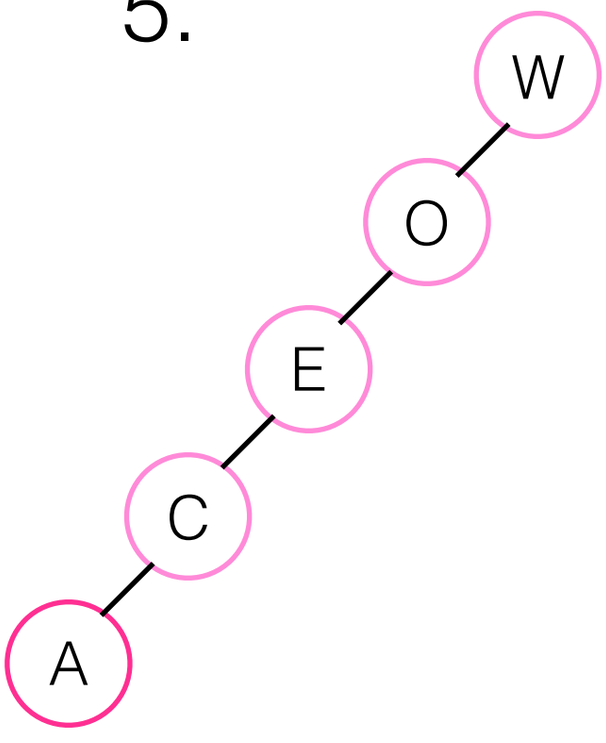
3.



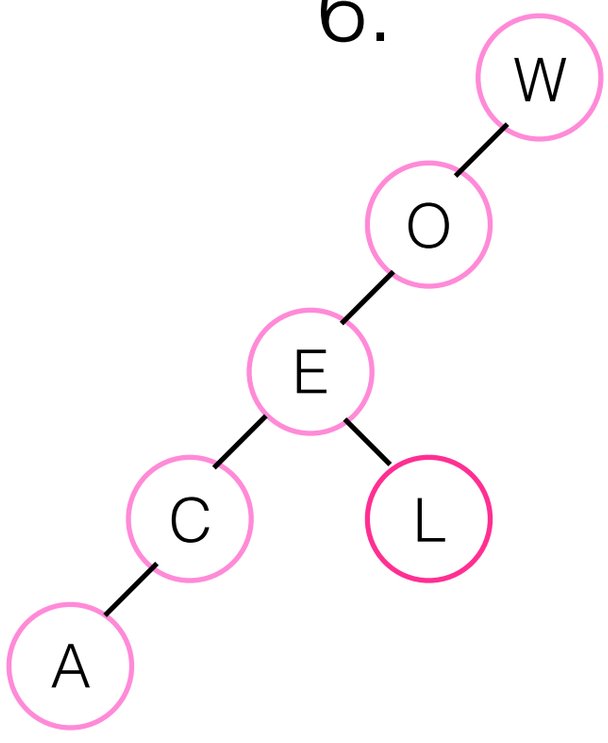
4.



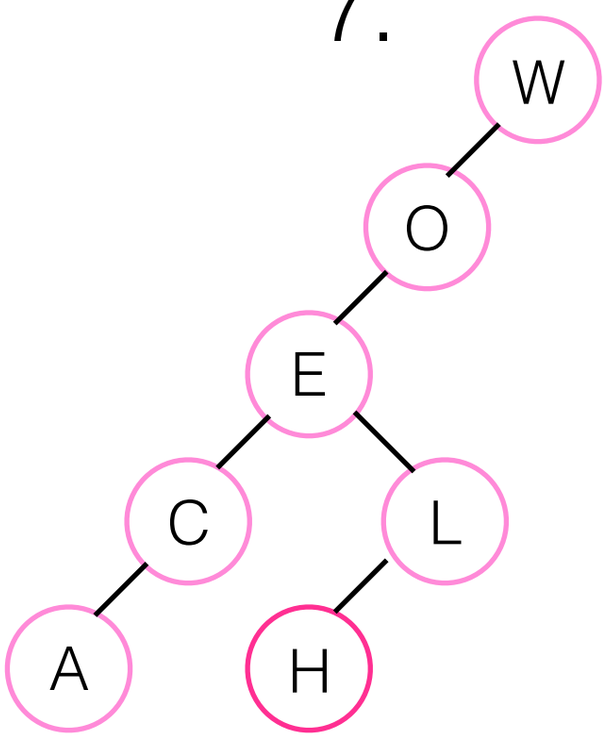
5.



6.

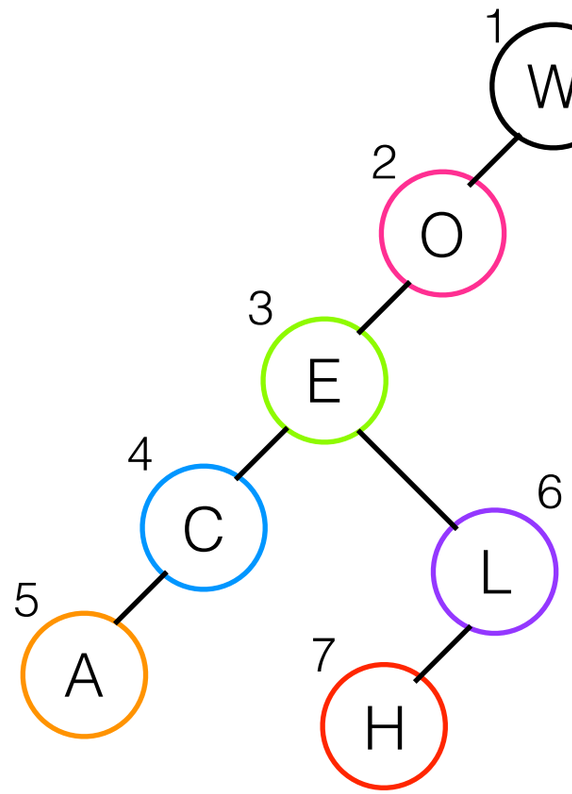


7.



Theory Question 1 b)

preorder: W O E C A L H

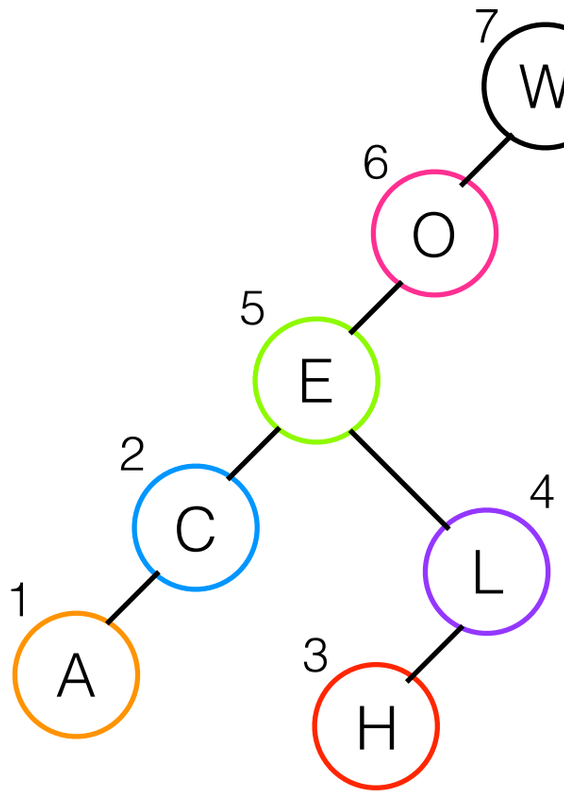


output: W O E C A L H

Preorder (Root, Left, Right)

Theory Question 1 b)

postorder: W O E C A L H

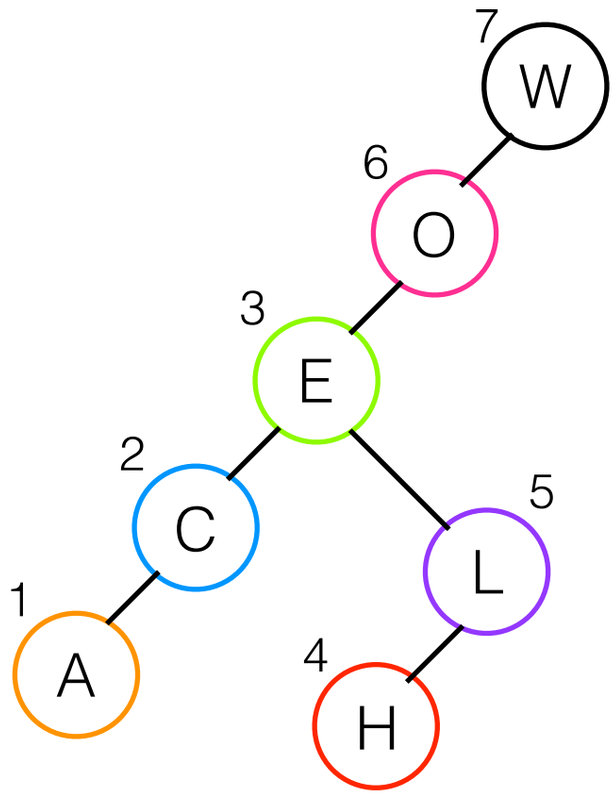


output: A C H L E O W

Postorder (Left, Right, Root)

Theory Question 1 b)

inorder: W O E C A L H



output: A C E H L O W

Postorder (Left, Root, Right)

Symbol Table Binary Search

Runtime(M) / T(M) = Runtime(N) / T(N)

<=> Runtime(N) = T(N) • Runtime(M) / T(M)

Insertion time complexity: 1/2 • N

M = 100

N = 200

(ns)

Compiler showed Runtime(M) = 445,370

Runtime(N) = (1/2 • 200) • 445,370 / (1/2 • 100) = 890,740

Compiler showed Runtime(200) = 886,384 ns

Symbol Table Binary Search

Runtime(M) / T(M) = Runtime(N) / T(N)

<=> Runtime(N) = T(N) • Runtime(M) / T(M)

Searching time complexity: lg(N)

M = 100

N = 200

(ns)

Compiler showed Runtime(M) = 381,609

Runtime(N) = lg(200) • 381,609 / lg(100) ≈ 439,046.8

Compiler showed Runtime(200) = 562,669 ns

Binary Search Tree

Runtime(M) / T(M) = Runtime(N) / T(N)

<=> Runtime(N) = T(N) • Runtime(M) / T(M)

Insertion time complexity: 1.39 • lg(N)

M = 100

N = 200

(ns)

Compiler showed Runtime(M) = 1,030,398

Runtime(N) = 1.39 • lg(200) • 1,030,398 / 1.39 • lg(100) ≈ 1,185,488

Compiler showed Runtime(200) = 1,972,164 ns

Binary Search Tree

Runtime(M) / T(M) = Runtime(N) / T(N)

<=> Runtime(N) = T(N) • Runtime(M) / T(M)

Searching time complexity: 1.39 • lg(N)

M = 100

N = 200

(ns)

Compiler showed Runtime(M) = 347,686

Runtime(N) = 1.39 • lg(200) • 347,686 / 1.39 • lg(100) ≈ 400,018

Compiler showed Runtime(200) = 439,168 ns