CS526 O2

Homework Assignment 3

**Problem 1 (10 points)**. Consider the following binary tree that stores an arithmetic expression.

+

+

\*

‐

/

+

6

3

2

4

2

6

\*

3

‐

9

6

Write the arithmetic expression of the tree and show the value of the expression. When you write the expression, make sure that you use parentheses in your expression correctly.

Answer: Expression: ((((6 + 2) - 3) + (2 \* 4)) + ((9 - 6) \* (6 / 3))) Value: 19

**Problem 2 (10 points).** Draw the arithmetic expression tree that stores the following expression:

((16 / (12 - (2 \* 4))) - (3 \* (5 - 4)))

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Answer:

\*

‐

/

\*

5

4

122

2

16

‐

4

3

For Problem 3, Problem 4, and Problem 5, use the following tree, which stores characters:

A

B

C

D

H

I

E

F

J

L

K

G

**Problem 3 (10 points)**. Show the sequence of nodes (characters) generated by preorder tree traversal.

Answer: A => B => D => I => E => J => L => C => F => K => G => H

**Problem 4 (10 points).** Show the sequence of nodes (characters) generated by postorder tree traversal.

Answer: I => D => L => J => E => B => K => F => G => H => C => A

**Problem 5 (10 points).** Show the sequence of nodes (characters) generated by breadth-first tree traversal.

Answer: A => B => C => D => E => F => G => H => I => J => K => L

**Problem 6 (10 points)**. Consider the following binary tree:

A

B

C

D

G

H

E

F

I

K

J

Show the sequence of nodes (characters) generated by inorder tree traversal.

Answer: H => D => B => I => E => J => A => F => K => C => G