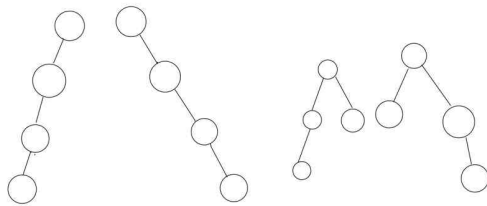


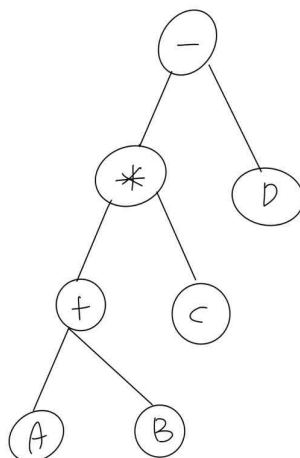
Review Questions

1. A tree is non-linear data structure which is mainly used to store data that is hierarchical in nature. Trees are used to store simple as well as complex data. Here simple means an integer value or character value and complex data means a structure or a record.
2. There are two ways to represent a binary tree: a linked list and an array. I prefer to implement it as a linked list. Because the linked list can be dynamically allocated and used without any size limitation.

3.



4.



5.

- (a) Complete binary tree : Every level, except possibly the last, is completely filled and all nodes appear as far left as possible.
- (b) Extended binary tree : Each node in the tree has either no child or exactly two children. Nodes having two children are called internal nodes and nodes having no children are called external nodes.
- (c) Tournament trees : They are being used to record the winner at each level.
- (d) Expression trees : Binary trees that used to store algebraic expressions.
- (e) Huffman trees : The Huffman coding algorithm uses a variable-length code table to encode a source character where the variable-length code table is derived on the basis of the estimated probability of occurrence of the source characters.
- (f) General trees : General trees are data structure that store elements hierarchically.
- (g) Forests : A forest is a disjoint union of trees.

6.

(a) D,E,F,H,J

(b) A,B,C,G

(c) A,B

(d) B,C,D,E,F,G,H,I

(e) B

(f) 4

(g) 1

(h) 2

(i)

in-order : DBEAFCHGI

pre-order : ABDECFGHI

post-order : DEBFHIGCA

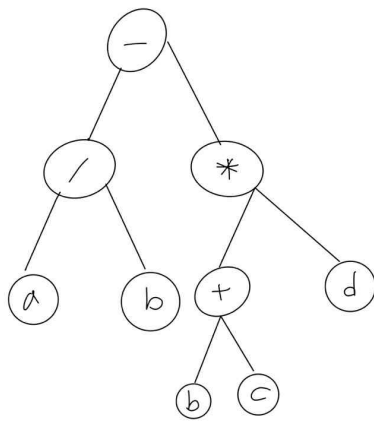
7.

(a) $e + D - a / b * c$

(b) prefix : $+e-D*/abc$, postfix : $eDab/c*-+$

(c) 34

8.



9.

First tree : complete binary tree X, full binary tree X

Second tree : complete binary tree O, full binary tree X

10.

maximum level : 6

11.

maximum height : 32

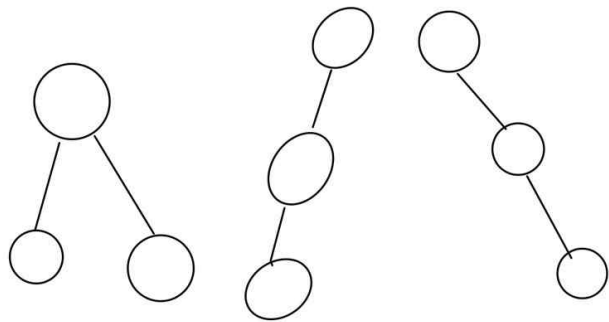
12.

level 3 = 8

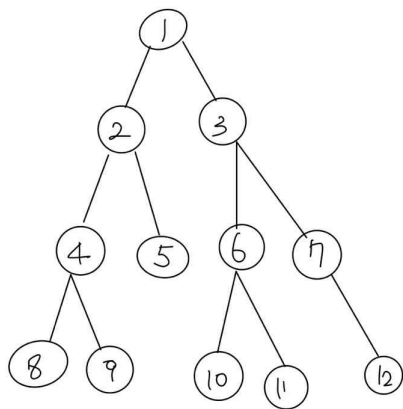
level 4 = 16

level 12 = 4096

13.



14.



15.

1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	
11	
12	10
13	11
14	
15	12

16.

T1=77
T2=49
T3=36

17.

T1 : A=000, B=001, C=01,100, D=101, F=11

T2 : A=00, B=01, C=100, D=101, E=11

T3 : A=000, B=001, C=01, D=1

Multiple-choice Questions

1.(a)

2.(a)

3.(d)

4.(a)

5.(c)

6.(a),(b)= 2^n

True or False

1. T

2. T

3. T

4. F

5. T

6. F

7. T

8. F

Fill in the Blanks

1. root

2. node

3. 2^k

4. two

5. sibling

6. structure, contents

7. $\log_2(n+1)$, n

8. each node in the tree has either no child or exactly two children.

9. pre-order

10. weight