

Course: CSC220-02

Student: Raya Farshad

Assignment Number 05

Due Date & time: 05-17-2018 at 11:50PM

My Assignment include Pro version ---10 Extra Creadit points

PART A-

1. Standard Version:

The screenshot shows a NetBeans IDE 8.2 interface with several tabs open: Start Page, TinyBookStd.java, MyTinyBookPro.java, Dictionary.java, and Output - asmt05 (run). The Output tab displays the following search results from a dictionary application:

```
run:
-----DICTIONARY 220 Standard-----
powered by Google Guava
Search: book
|
|   Book: A set of pages.
|   Book: To arrange something on a particular date.
|
Search: bo0k
|
|   Book: A set of pages.
|   Book: To arrange something on a particular date.
|
Search: bookable
|
|   Bookable: Can be ordered.
|
Search: bookbinder
|
|   Bookbinder: A person who fastens the pages of books.
|
Search: bookcase
|
|   Bookcase: A piece of furniture with shelves.
|
Search: csc220
|
|   Csc220: Data Structures.
|   Csc220: Ready to create complex data structures.
|   Csc220: To create data structures.
|
Search: Facebook
|
|   < NOT FOUND >
|
Search: !q

-----THANK YOU-----
BUILD SUCCESSFUL (total time: 2 minutes 18 seconds)
```

2. PRO Version:

The screenshot shows an IDE interface with several tabs at the top: Start Page, TinyBookStd.java, MyTinyBookPro.java, Dictionary.java, and Output - asmt05 (run). The left pane displays a project structure with various Java files and packages. The right pane shows the output of the Java code execution.

```
Book [verb] : To arrange something on a particular date.  
|  
Search: book noun  
|  
Book [noun] : A set of pages.  
|  
Search: bo0k adverb  
|  
<Not Found>  
|  
Search: book oops  
|  
<2d argument must be a part of speech>  
|  
Search: Facebook  
|  
<Not Found>  
|  
Search: csc220  
|  
Csc220 [noun] : Data Structures.  
Csc220 [verb] : To create data structures.  
Csc220 [adjective] : Ready to create complex data structures.  
|  
Search: csc220 adjective  
|  
Csc220 [adjective] : Ready to create complex data structures.  
|  
Search: bookcase  
|  
Bookcase [noun] : A piece of furniture with shelves.  
|  
Search: bookable verb  
|  
<Not found>  
|  
Search: bookable adjective  
|  
Bookable [adjective] : Can be ordered.  
|  
Search: bookcase  
|  
Bookcase [noun] : A piece of furniture with shelves.  
|  
Search: bookbinder v  
|  
<2d argument must be a part of speech>  
|  
Search: bookbinder verb  
|  
<Not found>  
|  
Search: !Q  
-----THANK YOU-----  
BUILD SUCCESSFUL (total time: 2 minutes 36 seconds)
```

PART B

CSC 220-02

Raya Farshad

Due date/time: 05-15-2018 at 11:59 PM

Assignment 05

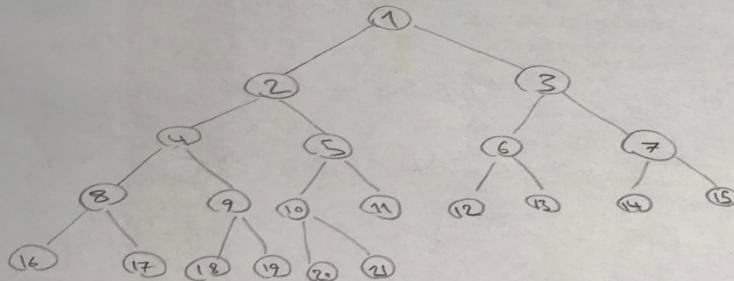
PART B - Trees, 22 Points

1. -- 2 Points --

height → Numbers of levels

Binary tree → Each node has at most 2 children

Full tree → All leaves (only one child) are on the same level.
Every nonleaf has exactly 2 children.



height : 5

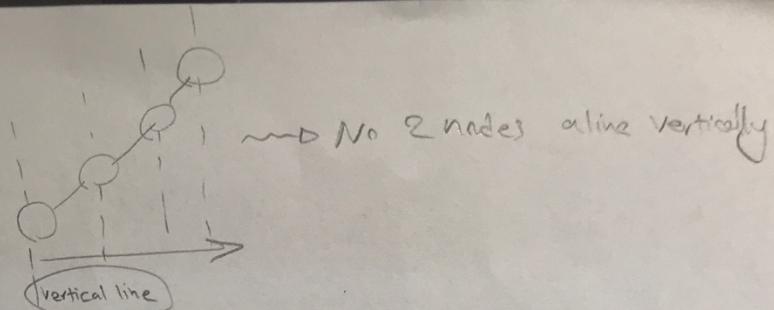
The tree is full

The tree is balance

2. --- 2 Points ---

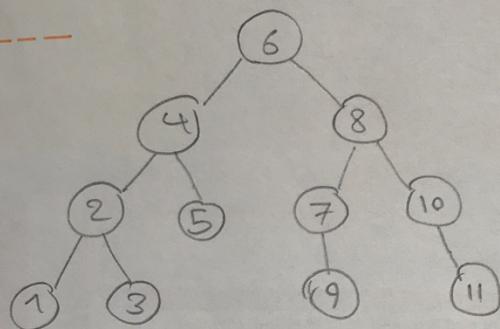
inorder : L root R.

No right children



3. --- 2 Points ---

Figure A-1



a. Preorder

root LR \rightarrow 6 4 2 1 3 5 ** 8 7 * 9 10 * 11

Finish with left
the go to right

b. Postorder

LR root \rightarrow 1 3 2 5 4 * 9 7 * 11 10 8 6

c. Inorder

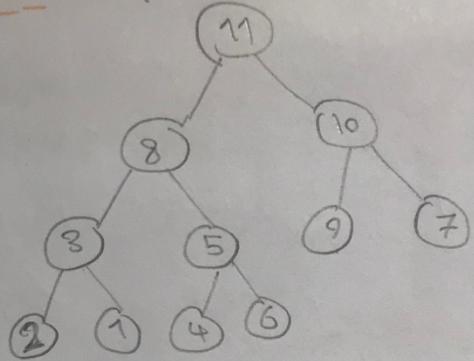
L root R \rightarrow 1 2 3 4 5 6 * 7 9 8 10 11

d. Level order

level \rightarrow 6 4 8 2 5 7 10 1 9 11

4 --- 2 Points ---

Figure A.2



a. Preorder root LR \rightarrow 11 8 3 2 1 5 4 6 10 9 7

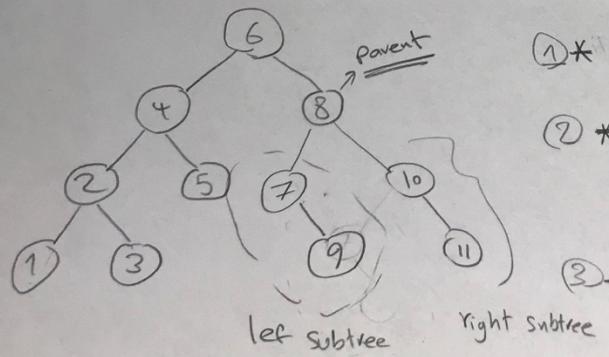
b. Postorder LR root \rightarrow 2 1 3 4 6 5 8 9 7 10 11

L root R \rightarrow 2 3 1 8 4 5 6 11 9 10 7

c. Inorder level \rightarrow 11 8 10 3 5 9 7 2 1 4 6

d. Level Order

5 --- 4 Points ---



The tree is binary search tree when

① * each node can have at most two child nodes

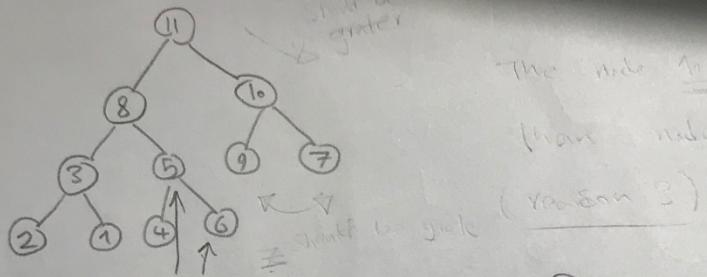
② * Data of the parent node must be greater than all the data present in its left sub-tree.

③ * Data of the parent node must be lesser than all the data present in its right sub-tree

a) The tree above is not a binary search tree

because node 9 is on the left sub tree of
the parent node 8 (reason 2)

b)



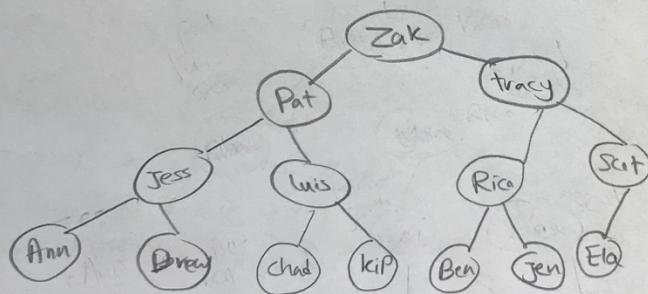
This figure A.2 is not max heap:

maxheap is where the value of the root node is greater than or equal to either of its children.
6 is greater than 5 so it is not max heap.

6--- 3 Points ---

maxheap ① the tree must be complete binary tree

② the data of parent node must be greater than all its child node

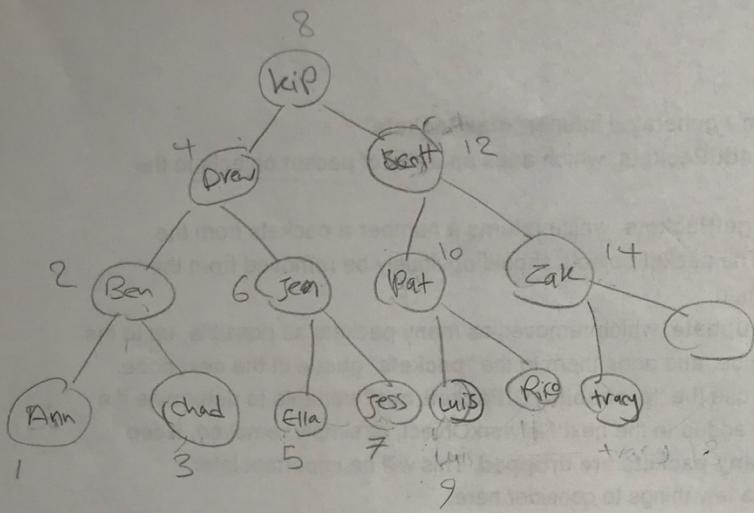


It is not unique the sub-tree left and right can change



7. --- 3 Points ---

It is not unique.



8. --- 2 Points ---

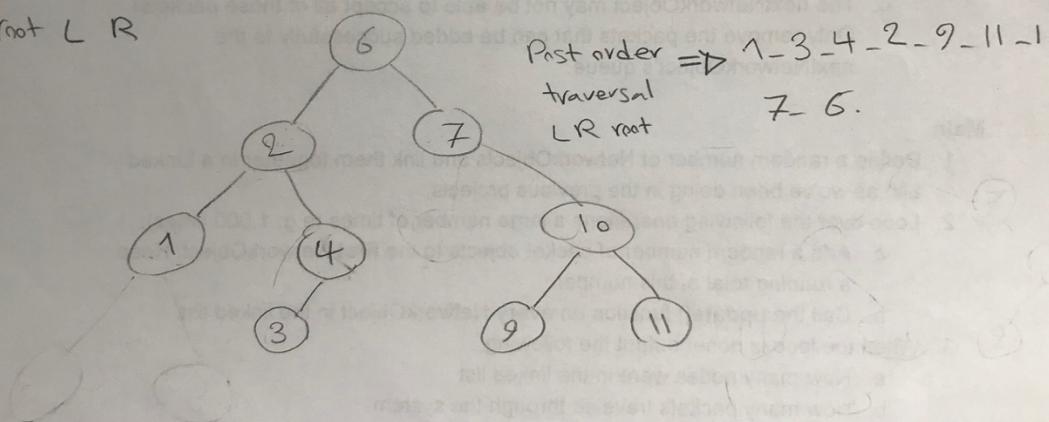
6, 2, 1, 4, 3, 7, 10, 9, 11

Root L R

Post order \Rightarrow 1-3-4-2-9-11-10

traversal
LR root

7-6.

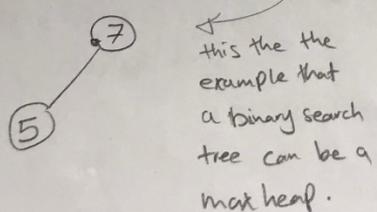


9. --- 2 Points ---

yes,

binary search tree

max heap



left to right
small to big

top to bottom
small to big
big to small