

BRONX COMMUNITY COLLEGE
of The City University of New York
DEPARTMENT OF MATHEMATICS and COMPUTER SCIENCE

CSI 33

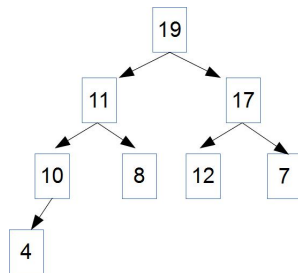
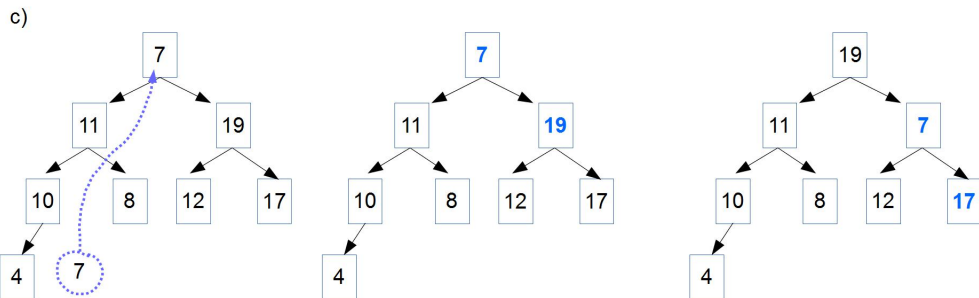
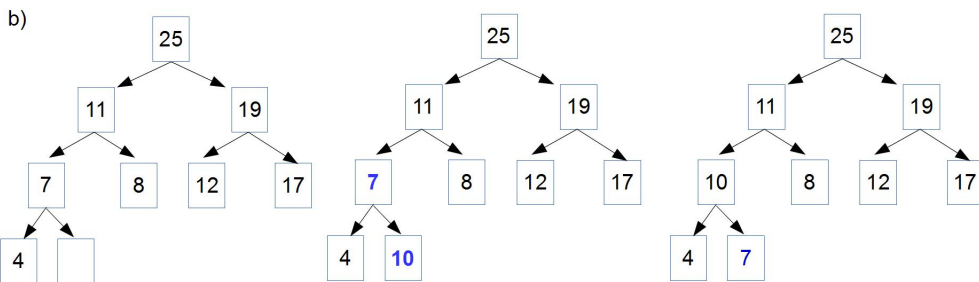
Final Exam Sample/outline Solutions

1 Part 1

Do all problems in this part.

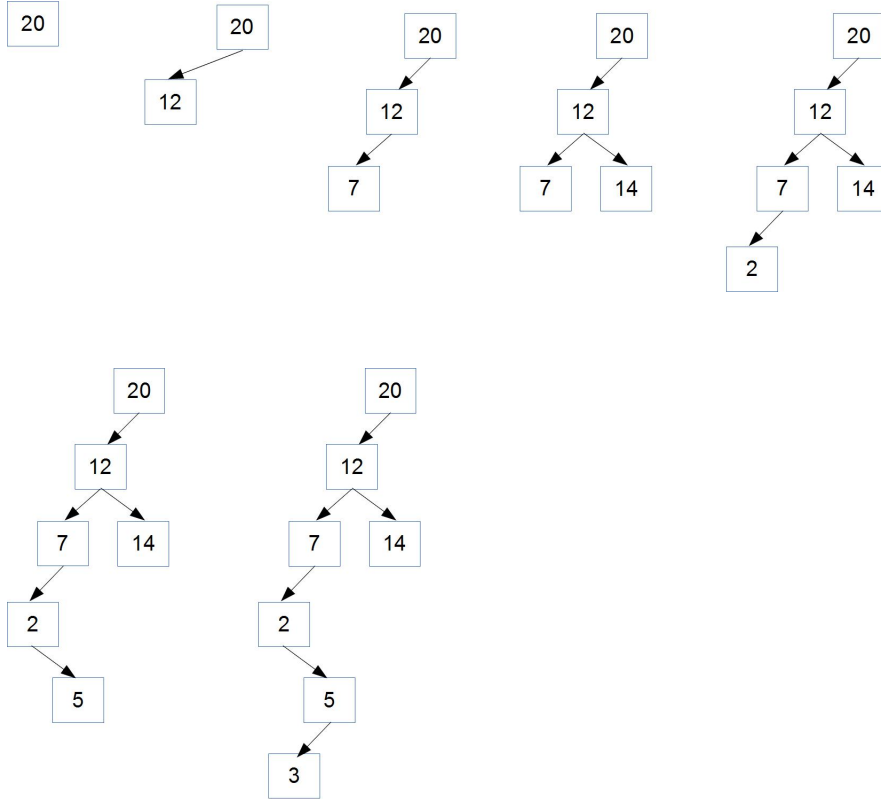
1. (10 points) True/False and Multiple Choice questions
- 2.

(a) [25, 11, 19, 7, 8, 12, 17, 4]



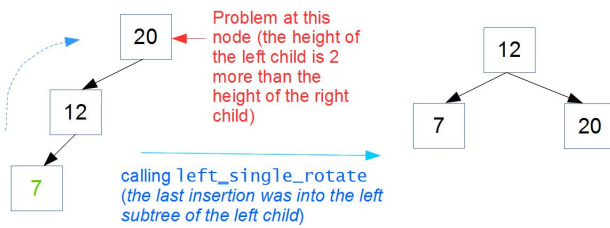
3. 20, 14, 12, 8, 7, 5, 3, 2

4.

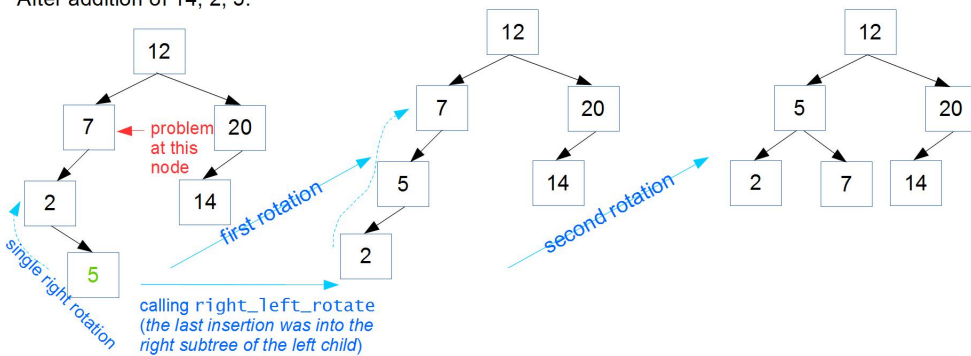


5.

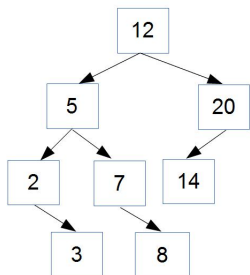
After addition of 20, 12, 7:



After addition of 14, 2, 5:



After addition of 3, 8:



6. The adjacency matrix:

	A	B	C	D	E
A	0	1	1	0	0
B	0	0	0	1	0
C	0	1	0	0	0
D	0	0	0	0	1
E	0	0	0	0	0

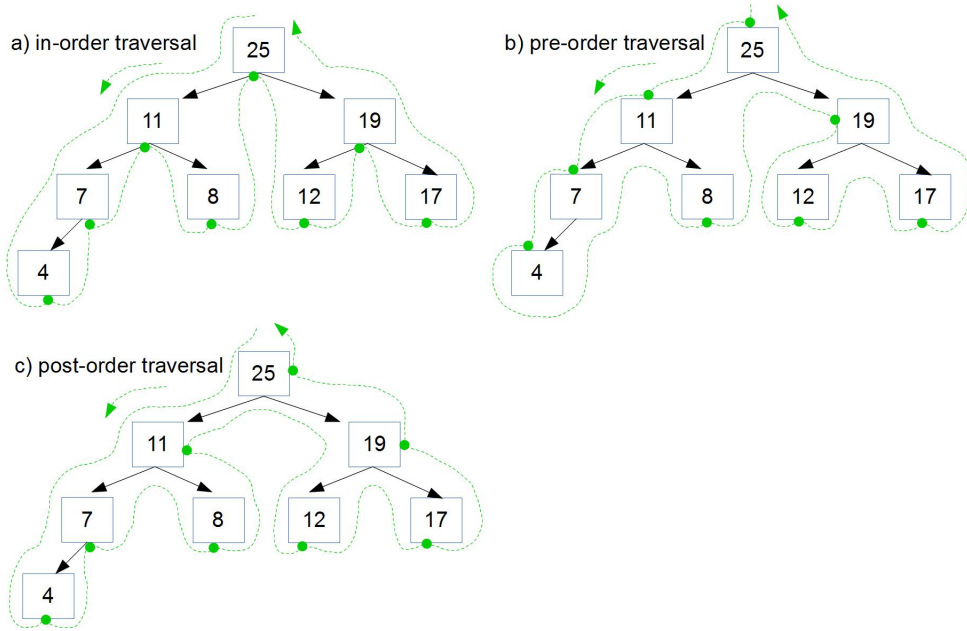
The adjacency list (without weights):

```
[
[A, [B, C]],
[B, [D]],
[C, [B]],
[D, [E]],
[E, []]
]
```

2 Part II

Do any 2 problems.

1.

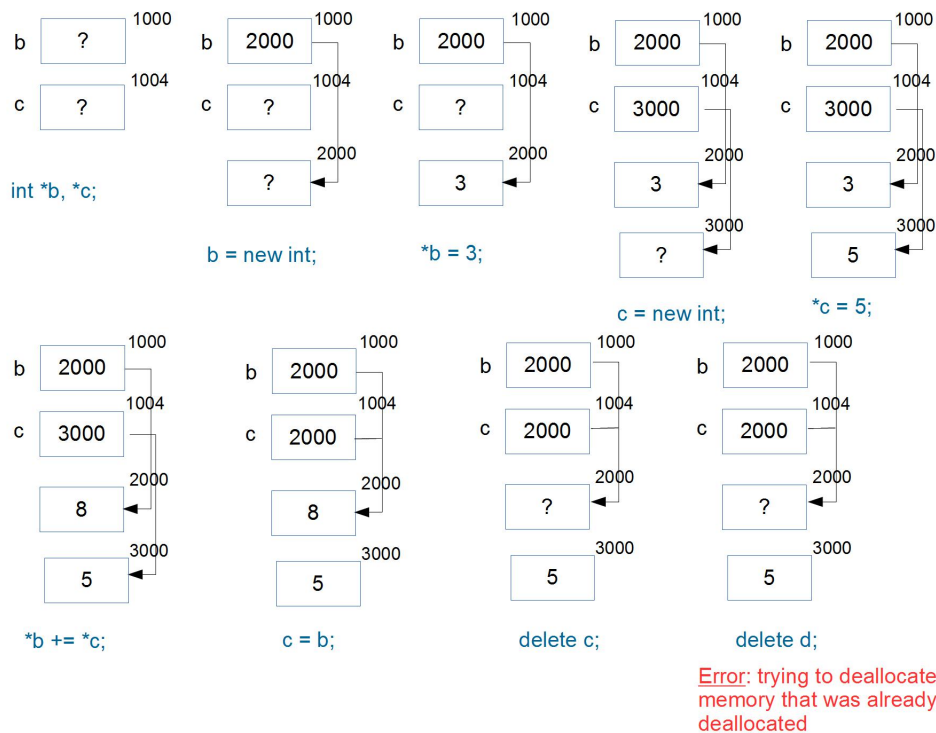


inorder: 4, 7, 11, 8, 25, 12, 19, 17

preorder: 25, 11, 7, 4, 8, 19, 12, 17

postorder: 4, 7, 8, 11, 12, 17, 19, 25

2. We have a memory leak (lost information about the memory allocated for integer, with 5 in it).



One way to fix it is to remove line `c=b;`, another is to use temporary storage `tmp`, before the assignment `c=b;`:

```
tmp = c;
c = b;
delete c;
delete tmp;
```

3. posted separately as program

4. Let's use hash function to get the locations for each of the value to store

$f(4005) = 4005 \% 7 = 1$, - put value 4005 to the memory location 1.

$f(1908) = 1908 \% 7 = 4$, - put value 1908 to the memory location 4.

$f(7890) = 7890 \% 7 = 1$, - put value 7890 to the memory location 1. Since the slot is already occupied, by separate chaining approach, create a node and link it to the node at location 1.

$f(1928) = 1928 \% 7 = 3$, - put value 1928 to the memory location 3.

$f(0035) = 0035 \% 7 = 0$, - put value 0035 to the memory location 0.

$f(1076) = 1076 \% 7 = 5$, - put value 1076 to the memory location 5.

$f(0187) = 0187\%7 = 5$, - put value 0187 to the memory location 5. Since the slot is already occupied, by separate chaining approach, create a node and link it to the node at location 5.

$f(1098) = 1098\%7 = 6$, - put value 1098 to the memory location 6.

$f(7777) = 1928\%7 = 0$, - put value 7777 to the memory location 0. Since the slot is already occupied, by separate chaining approach, create a node and link it to the node at location 0.

$f(1108) = 1108\%7 = 2$, - put value 1108 to the memory location 2.

$f(0089) = 0089\%7 = 5$, - put value 0089 to the memory location 0. the slot is already occupied, hence create a node and link it to the previous node at location 5 (node with 0187).

$f(1625) = 1625\%7 = 1$, - put value 1625 to the memory location 1. the slot is already occupied, hence create a node and link it to the previous node at location 0 (node with 7890).

