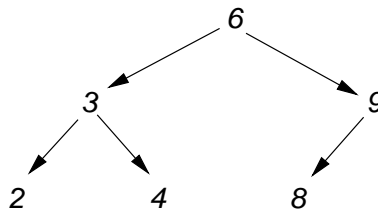


This is an ungraded quiz - you don't even need to put your name on it. My goal is to learn what the class knows and doesn't know, so I can adjust the pace accordingly. This is closed book (although exams will normally be open book). Skim through and do what is easy for you first, then come back to the ones you find harder. If you spend all your time on something you don't know well, and don't get to something you do know well, it defeats the whole purpose. Please record the time it takes you to complete (up to two hours.)

1 Search Trees

Given below is a balanced binary search tree.



1.1 Search

How long does it take to look up an item in a balanced binary search tree?

1.2 Insertion

Insert item '5' into the tree (you can draw on the above diagram). Is it still a binary search tree? Is it still a *balanced* binary search tree? If so, discuss why. If not, show how to balance the tree.

3 Relational Databases

Here are a set of three relational tables.

<i>Conference</i>	<i>Year</i>	<i>Location</i>
VLDB	2007	Vienna
KDD	2007	San Jose
ICDM	2006	Hong Kong
SIGMOD	2007	Beijing

<i>Conference</i>	<i>Year</i>	<i>Attendee</i>
ICDM	2006	Chris Clifton
SIGMOD	2007	Chris Clifton

<i>Conference</i>	<i>Sponsor</i>
KDD	ACM
ICDM	IEEE
ICDE	IEEE
SIGMOD	ACM

3.1 Simple query

Give a query that lists the sponsors of conferences *Chris Clifton* has attended a conference in. Express the query in both

1. SQL, and

2. Relational Algebra

3.2 Functional Dependencies

Give functional dependencies that hold on the above database. Explain how you got them.

3.3 Normalization

Given your dependencies, is the database in Boyce-Codd Normal Form? Third-Normal form? Why?

3.4 Challenge Problem: Complex query

Give a query that determines the best location if you want your conference to have high attendance, i.e., for each conference, what location gives the highest attendance? Which location does this for the most conferences?

Please come back and do this only if you have done all you can on the rest of the quiz - I'd rather see if you know other things first.

Total time taken: