Intro to Databases
EECS 116

Assignment 7
Relational Design, Indexing & Transactions

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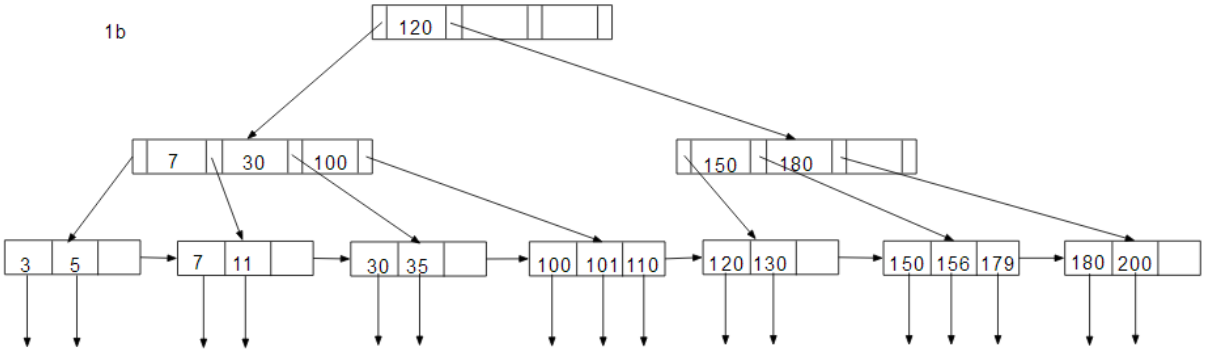
2.1 Problem 1

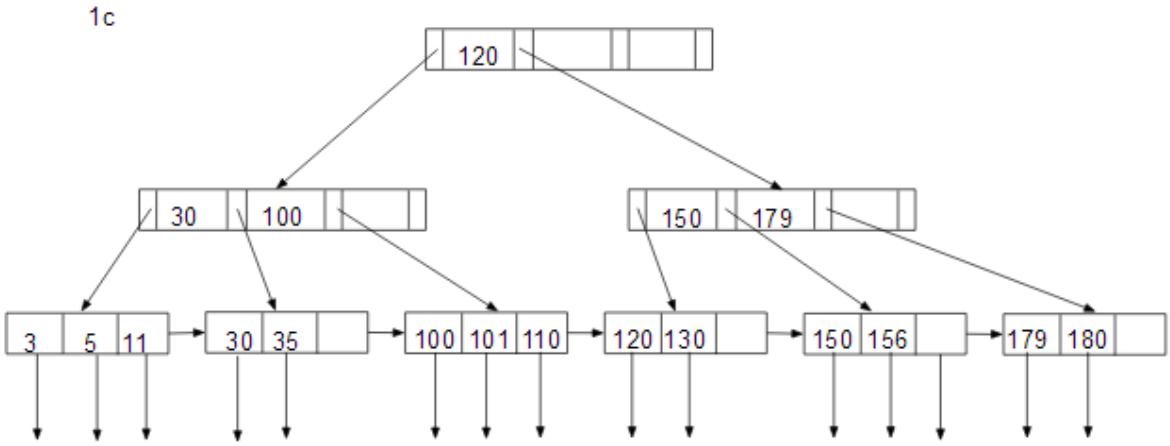
2.1.1 Problem 1.a

The minimum total number page reads required for the tree is [1] (if the key is in the root)
The maximum total number page reads required for the tree is [3] (if the key is in a leaf)
The efficient, quick searching property of B+ trees come in play here.

2.1.2 Problem 1.b



2.1.3 Problem 1.c



2.2 Problem 2

2.2.1 Problem 2.1

```
SELECT CITY, COUNT(*)
    FROM user
    GROUP by city;
```

2.2.2 Problem 2.2

```
CREATE INDEX city_index ON user(city);
```

We chose to use city as the index because that is the condition we are looking for and grouping by. This directly increases our speedup. If we were to use any other attributes such as bid, name, zip, or state, those indexes would not result in a speedup if having a condition looking for the city.

2.2.3 Problem 2.3

	Execution Time
Before creating an index (A)	347.601 sec
After creating an index (B)	3.058 sec
Time diference (A-B)	344.543 sec