Quiz 6: Indexing

1. (2 points) A telecommunications company is struggling because finding all the outgoing call records for a given customer takes too long. The following query is being used: SELECT * FROM CallInfo WHERE fromPhonenumber = '9491234567'
   a. (1 pt) Write a statement that creates an index which speeds this query up.
      CREATE INDEX cifp ON CallInfo (fromPhonenumber)
   b. (1 pt) Should your index be clustered or unclustered? Explain briefly.
      Clustered, because that stores all calls from the same number together, which makes retrieving them faster.

2. (6 points) Take the B+ Tree (of order d=1) shown below. For every question that follows, please start with the original version of the tree when answering. (And recall that B+ Tree leaf pages contain search keys + their associated information.)

   ![B+ Tree Diagram]

   a. (1 pt) What is the height of the tree?  ___3___
   b. (1 pt) How many page reads are needed to scan all of the values for the range query [3, 8] (inclusive)?  ___6___ (Because: 5 + 1 to scan to where you can tell you’ve exhausted the range)
   c. (2 pts) Show the tree after inserting the value 1.
d. (2 pts) Show the tree after deleting the value 4.

3. (2 points) Imagine if the initial tree above had been created by being bulkloaded (with the same values).
   a. (1pt) Draw what the bulkloaded tree would look like.

   b. (1 pt) How many pages would be needed to run the range query \([3, 8]\)? 4