CHAPTER 15: ALGORITHMS FOR QUERY PROCESSING AND OPTIMIZATION

15.13 Consider SQL queries Q1, Q8, Q1B, Q4, Q27 from Chapter 8.

(a) Draw at least two query trees that can represented each of these queries. Under what circumstances would you use each of your query trees?

(b) Draw the initial query tree for each of these queries; then show how the query tree is optimized by the algorithm outlined in section 15.7.

(c) For each query, compare your on query trees of part (a) and the initial and final query trees of part (b).

15.14 A file of 4096 blocks is to be sorted with an available buffer space of 64 blocks. How many passes will be needed in the merge phase of the external sort-merge algorithm?

15.15 Develop (approximate) cost functions for the PROJECT, UNION, INTERSECTION, SET DIFFERENCE, and CARTESIAN PRODUCT algorithms discussed in section 15.4.

15.17 Can a nondense (sparse) index be used in the implementation of an aggregate operator? Why or why not?

15.21 Extend the sort-merge join algorithm to implement the left outer join.

15.22 Compare the cost of two different query plans for the following query:
salary > 40000 select (EMPLOYEE |X| DNO=DNUMBER DEPARTMENT)
Use the database statistics in Figure 15.8