Alexandria University
Faculty of Engineering
Comp. & Comm. Engineering
CC471: Database Systems
Spring 2021

جامعة الاسكندرية
كلية الهندسة
برنامج هندسة الحاسب والاتصالات
مادة قواعد البيانات
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Sheet6
QUERY PROCESSING & EXTERNAL SORTING

1) Give examples of a conjunctive selection and a disjunctive selection query and discuss how there may be multiple options for their execution.
2) Discuss alternative ways of eliminating duplicates when a "`SELECT Distinct <attribute>`" query is evaluated.
3) How are aggregate operations implemented?
4) How are outer join and non–equi-join implemented?
5) What is the iterator concept? What methods are part of an iterator?
6) Can a nondense index be used in the implementation of an aggregate operator? Why or why not? Illustrate with an example.
7) Extend the sort-merge join algorithm to implement the LEFT OUTER JOIN operation.
8) Suppose you have a file with 10,000 pages and you have three buffer pages. Answer the following questions for each of these scenarios, assuming that our most general external sorting algorithm is used:
   a) A file with 10,000 pages and three available buffer pages.
   b) A file with 20,000 pages and five available buffer pages.
   c) A file with 2,000,000 pages and 17 available buffer pages.
      i. How many runs will you produce in the first pass?
      ii. How many passes will it take to sort the file completely?
      iii. What is the total I/O cost of sorting the file?
      iv. How many buffer pages do you need to sort the file completely in just two passes?

How to submit the homework assignments?

- Solve the sheet individually without looking up the solution on the Internet. The sheet is to practice; it is a learning tool not an exam.
- Assignments are to be **handwritten**.
- Papers are to be scanned (I like camscanner app). Put all images in a pdf file (camscanner does that for you)