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

جامعة الاسكندرية
كلية الهندسة
برنامج هندسة الحاسب والاتصالات
مادة قواعد البيانات
ربيع ٢٠٢١

Sheet7
QUERY OPTIMIZATION

1) Consider the following queries.
   a) Draw at least two query trees that can represent 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 query optimization heuristic algorithm.

```
[Q1]  SELECT Fname, Lname, Address
      FROM Employee, Department
      WHERE Dname='Research'
        AND Dnumber=Dno;
[Q2]  SELECT E.Fname, E.Lname, S.Fname, S.Lname
      FROM Employee E, Employee S
      WHERE E.SuperSSN = S.Ssn;
[Q3]  SELECT Pnumber, Pname, count(*)
      FROM Project, Works_on, Employee
      WHERE Pnumber = Pno
        AND Ssn = Essn
        AND Dno = 5
      GROUP BY Pnumber, Pname;
```

2) Develop cost functions for the PROJECT, UNION, INTERSECTION, SET DIFFERENCE, and CARTESIAN PRODUCT algorithms.
3) Calculate the cost functions for different options of executing the JOIN operation $Department \bowtie_{Mgr_{ssn}=Ssn} Employee$

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)