

BCSE302L Database System
Slow Learner Assignment-II

1. Consider the following relations:

Worker(Pid, person-name, street, city, Contact, age, Gender) works(Pid, CID, salary)

Company(CID, company-name, city, contact) manages(Pid, manager-name)

Write the following Query in relational algebra:

- (i) How many senior citizen female worker is working in the company?
- (ii) Display the female worker details who are getting salary more than 10000.
- (iii) Display the worker details who are working in Chennai.
- (iv) Display the manager name of all male worker.

2. Consider the following relational schema

Product (Brand, Model, Type)

PC (Model, CPU, Speed, RAM, HD, Price);

Laptop (Model, CPU, RAM, HD, ScreenSize, Screen Type, Price)

Printer (Model, Colour, Price, Type)

Assume that the model number is unique for each brand. Write the Following query into relational algebra:

- (i) Display the specification of dell 15 inch Laptop.
- (ii) How many Samsung Colour printers are available in stock?
- (iii) Display all core i7 laptop.
- (iv) Display all core i5 and 16 GB RAM based computer.

3. Consider the Car database with the following relation:

Distributor (DID, Distributor_Name, Address, Contact1, Contact2)

Cars (CID, Car_Name, Color, Price, Car_Type)

Catalogue (DID, CID, Cost, Model)

Write the following queries in relational algebra:

- (i) How many swift car distributors are available in Vellore?
- (ii) Display all distributor available in Vellore having red colour car.
- (iii) Display the name, address and contact number of the distributors who distribute SUV or Sedan Cars.
- (iv) Display the cost of SUV given by all distributors.

4. Consider a relational database about the International Sled Dog (Husky) Racing Association (ISDRA). The database consisting of the following tables (where the primary keys are underlined):

Dogs (did, dname, dob, weight)

Mushers (mid, mname)

Races (mid, did, raceNumber)

Write the relational algebra expression for the following:

- a. Find the number of times that each dog has participated in races. (3)

- b. Find the names of mushers who have used both “Dubs” and “Harry” in races before.
(3)
 - c. Find the names of dogs whose age is between 7 to 11 (3)
 - d. Find the names of mushers who have raced with all the dogs in the past. (3)
 - e. Find the minimum and average weight of dogs.
5. Consider the following SQL query and answer the following:
 Select s.regno, s.name, cl. Sem, cl.slot from student s, class cl, where s.regno=cl.regno
 and cl.sem>4 and cl.slot='B2' and s.branch ='DS'.
 (i) Write the relational algebra expression that is equivalent to this query.
 (ii) Find an optimized query using heuristic based approach. Explain all the process.
 6. Consider the following SQL query and answer the following:
 SELECT A.name FROM Applicants A, Schools S, Major M WHERE A.sid = S.sid AND
 A.id = M.id AND A.city = 'Vellore' AND S.rank < 100 AND M.major = 'ECE'.
 (i) Write the relational algebra expression that is equivalent to this query.
 (ii) Find an optimized query using cost based approach. Explain all the process.
 7. Consider question 4 and write the SQL query and draw the query tree for the following
 using heuristic rules.
 Find the names of dogs that have never participated in any races and age of the dogs is
 more than 5 years.
 8. Construct an Initial Query Tree and Optimized Query Tree using Heuristic Query
 Optimization Techniques for the SQL query given below.
 Select e.name, p.project_name from employee e, department d, workson w, project p
 where e.dep_number=d.dep_number and e.ssn=w.ssn and w.project_id=p.project_id and
 d.dname='SBST' and p.project_name='OS';