Database Management System (3130703)
CE Dept
SVIT, Vasad

Assignment 1

1. Consider the following schema and write the **relational algebra queries**.

   Employee(person_name,street,city)
   Works(person_name, company_name,salary)
   Company(company_name,city)
   Manages(person_name, manager_name)

   a. Find the names of all employees who work for First Bank Corporation.
   b. Find the names and cities of residence if all employees who work for First Bank Corporation
   c. Find the names, street address and cities of residence of all employees who work for First Bank Corporation and earn more than $10,000 per annum.
   d. Find the names of all employees in this database who live in the same city as the company for which they work.
   e. Assume the companies may be located in several cities. Find all companies located in every city in which Small Bank Corporation is located.
2. Consider the below relational database. Give an expression in the **relational algebra to express** each of the following queries:

   Employee(person_name,street,city)
   Works(person_name, company_name,salary)
   Company(company_name,city)

   a. Find the names of all employees who live in city “Miami”.
   b. Find the names of all employees whose salary is greater than $100,000.
   c. Find the names of all employees who live in “Miami” and whose salary is greater than $100,000.
3. Consider the below relational database . Give an expression in the **relational algebra to express** each of the following queries:

   branch(branch name, branch city, assets)
   customer (customer name, customer street, customer city)
   loan (loan number, branch name, amount)
   borrower (customer name, loan number)
   account (account number, branch name, balance)
   depositor (customer name, account number)

   a. Find the names of all branches located in “Chicago”.
   b. Find the names of all borrowers who have a loan in branch “Downtown”.

4. Consider the below relational database . Give an expression in the **relational algebra to express** each of the following queries:

   branch(branch name, branch city)
   account (account number, branch name, balance)
   depositor (customer name, account number)

   a. Find the list of customer who have account at “ABC” Branch.
   b. Find out all the customers who have account in “Ahmedabad” city and balanace is greater than 10,000.
   c. Find all list of all branch name with their maximum balance.

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Assignment 2

1. Consider the following schema and writet the SQL for the given Statements.

   Person(“ss#,name,address)
   Car(license,year,model)
   Accident(date,driver,damage-amount)
   Owns(ss#,license)
   Log(license,date,driver)

   a. Find the total number of people whose cars were involved in accidents in 2009.
   b. Find the number of accidents in which the cars belonging to “S.Sudarshan”
   c. Add new customer to the database.
   d. Add a new accident recorded for the Santro belonging to “Korth”.

2. Difference between generalization vs Specialization.

3. Draw the ER diagram for the following systems, in which display the primary key, composite attribute,multivalue attribute, specialization ,generalization, weak entity set etc.
   a. Bank management system
   b. Library management system
   c. University management system

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Assignment 3

1. Compute the closure of the following set F of functional dependencies for relation schema R = (A, B, C, D, E).

   A → BC
   CD → E
   B → D
   E → A

   List the candidate keys for R.

2. Using the functional dependencies of relation schema R = (A, B, C, D, E).

   A → BC
   CD → E
   B → D
   E → A

   Compute the canonical cover Fc.
3. Relational schema R=(A,B,C,G,H,I) and the set F of functional dependencies {A→B,A→C,CG→H,CG→I,B→H} Find the list several members of F+
4. What is database anomaly. explain different type of database anomaly with example.
5. Given relation R with attributes A,B, C,D,E,F and set of FDs as A-> BC, E-> CF, B->E and CD-> EF. Find out closure {A,B} + of the set of attributes.
6. Consider table R(A,B,C,D,E) with FDs as A->B, BC->E and ED-> A. The table is in which normal form? Justify your answer.