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CSC 134-02

Assignment 2

Due: 3/1/22

CSC 134-02 Database Management Systems (Spring 2022)

Assignment 2 (100 points)

Relational Data and Basic SQL

Due at 11:59 pm, Tuesday March 1, 2022

Please review lecture slides carefully before you start to work on your assignment. This assignment has 3 questions.

Database Population (must be done before you work on all questions). Instructions:

1. Install MySQL and MySQL workbench by following the note titled "Get Started with MySQL and MySQL Workbench".
2. Launch "MySQL Workbench".
3. Create your database using your first name, followed by your lastname. For example, my database should be named "victor_chen". Refresh and you can see your database in the left pane of the GUI.
4. Download the file *SQL_Script_A2.sql* from Canvas. Open the file in MySQL Workbench. Examine it to understand all the statements.
5. In the SQL editing window, run all the statements in *SQL_Script_A2.sql* and observe the running result. The script gives you the following database.

Note: Foreign key constraints are ignored in the script provided.

EMPLOYEE

Fname	Minit	Lname	Ssn	Bdate	Address	Sex	Salary	Super_ssn	Dno
John	B	Smith	123456789	1965-01-09	731 Fondren, Houston, TX	M	30000	333445555	5
Franklin	T	Wong	333445555	1955-12-08	638 Voss, Houston, TX	M	40000	888665555	5
Alicia	J	Zelaya	999887777	1968-01-19	3321 Castle, Spring, TX	F	25000	987654321	4
Jennifer	S	Wallace	987654321	1941-06-20	291 Berry, Bellaire, TX	F	43000	888665555	4
Ramesh	K	Narayan	666884444	1962-09-15	975 Fire Oak, Humble, TX	M	38000	333445555	5
Joyce	A	English	453453453	1972-07-31	5631 Rice, Houston, TX	F	25000	333445555	5
Ahmad	V	Jabbar	987987987	1969-03-29	980 Dallas, Houston, TX	M	25000	987654321	4
James	E	Borg	888665555	1937-11-10	450 Stone, Houston, TX	M	55000	NULL	1

DEPARTMENT

Dname	Dnumber	Mgr_ssn	Mgr_start_date
Research	5	333445555	1988-05-22
Administration	4	987654321	1995-01-01
Headquarters	1	888665555	1981-06-19

DEPT_LOCATIONS

Dnumber	Dlocation
1	Houston
4	Stafford
5	Bellaire
5	Sugarland
5	Houston

WORKS_ON

Essn	Pno	Hours
123456789	1	32.5
123456789	2	7.5
666884444	3	40.0
453453453	1	20.0
453453453	2	20.0
333445555	2	10.0
333445555	3	10.0
333445555	10	10.0
333445555	20	10.0
999887777	30	30.0
999887777	10	10.0
987987987	10	35.0
987987987	30	5.0
987654321	30	20.0
987654321	20	15.0
888665555	20	NULL

PROJECT

Pname	Pnumber	Plocation	Dnum
ProductX	1	Bellaire	5
ProductY	2	Sugarland	5
ProductZ	3	Houston	5
Computerization	10	Stafford	4
Reorganization	20	Houston	1
Newbenefits	30	Stafford	4

DEPENDENT

Essn	Dependent_name	Sex	Bdate	Relationship
333445555	Alice	F	1986-04-05	Daughter
333445555	Theodore	M	1983-10-25	Son
333445555	Joy	F	1958-05-03	Spouse
987654321	Abner	M	1942-02-28	Spouse
123456789	Michael	M	1988-01-04	Son
123456789	Alice	F	1988-12-30	Daughter
123456789	Elizabeth	F	1967-05-05	Spouse

Now, you are ready to proceed to manipulate the database.

Notice: For any SELECT statement in this assignment, you must give a short name to each table and qualify each column name with table short name to receive full credit.

Question 1 (40 pts): Please write the SQL statements to answer the following

queries. (one statement per query)

1.1 Retrieve the name and address of all employees who work for the 'Administration' department.

SELECT E.Fname, E.Minit, E.Lname, E.Address

FROM EMPLOYEE **AS** E, DEPARTMENT **AS** D

WHERE D.Dname = 'Administration' **AND** D.Dnumber = E.Dno;

1.2 For each employee, retrieve the employee's first and last name and the first name and last name of his or her immediate supervisor.

SELECT E.Fname, E.Lname, S.Fname, S.Lname

FROM EMPLOYEE E, EMPLOYEE S

WHERE E.Super_ssn = S.Ssn;

1.3 Show the resulting salaries if each employee working on the 'Newbenefits' project is given a 50 percent increase.

SELECT E.Fname, E.Lname, 1.5 * E.Salary **AS** New_salary

FROM EMPLOYEE **AS** E, WORKS_ON **AS** W, Project **AS** P

WHERE E.Ssn = W.Essn **AND** W.Pno = P.Pnumber **AND** P.Pname = 'Newbenefits';

Notice: You should not actually change any data in the database. The result should show in such three columns: Lname, Fname, New_salary.

1.4 Retrieve salaries of all employees whose address is in Houston, Texas. Duplicates should be eliminated.

SELECT **DISTINCT** E.Salary

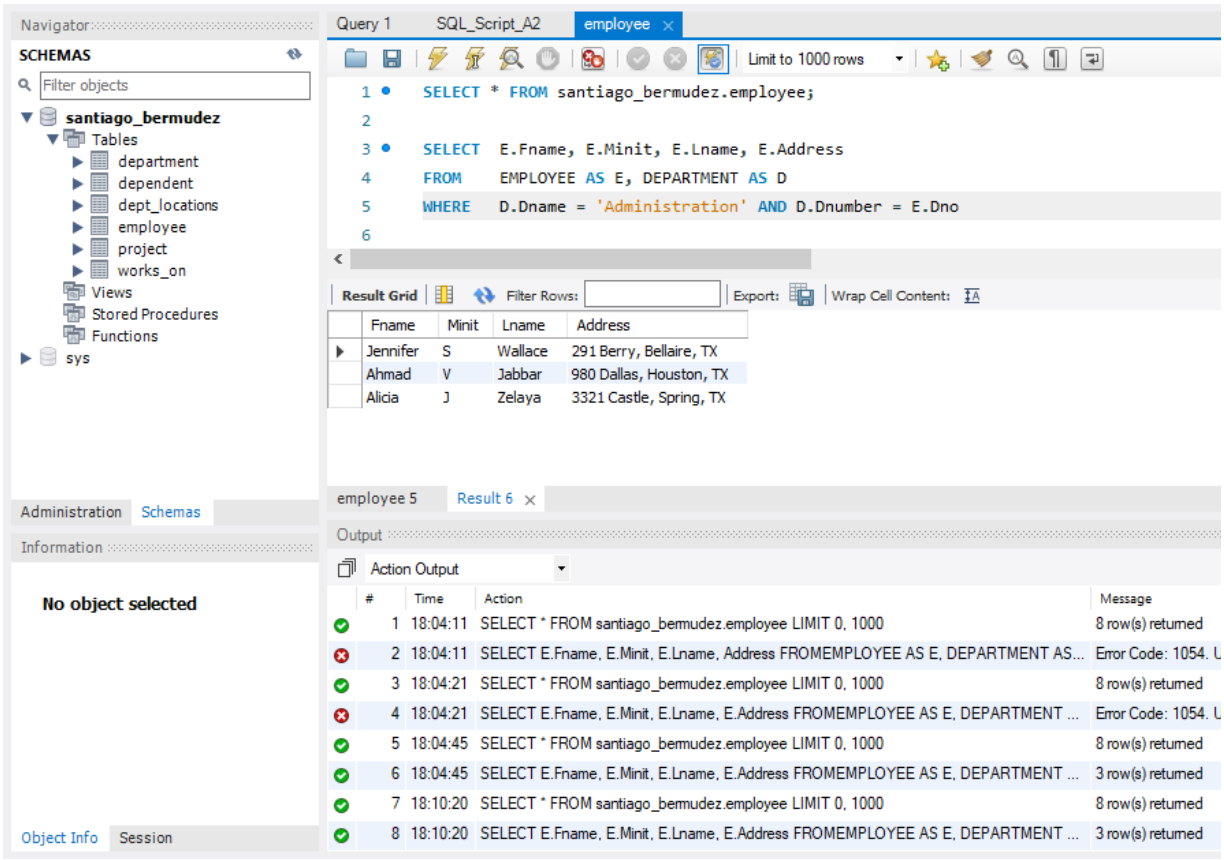
FROM EMPLOYEE E

WHERE E.Address Like '%Houston, TX%';

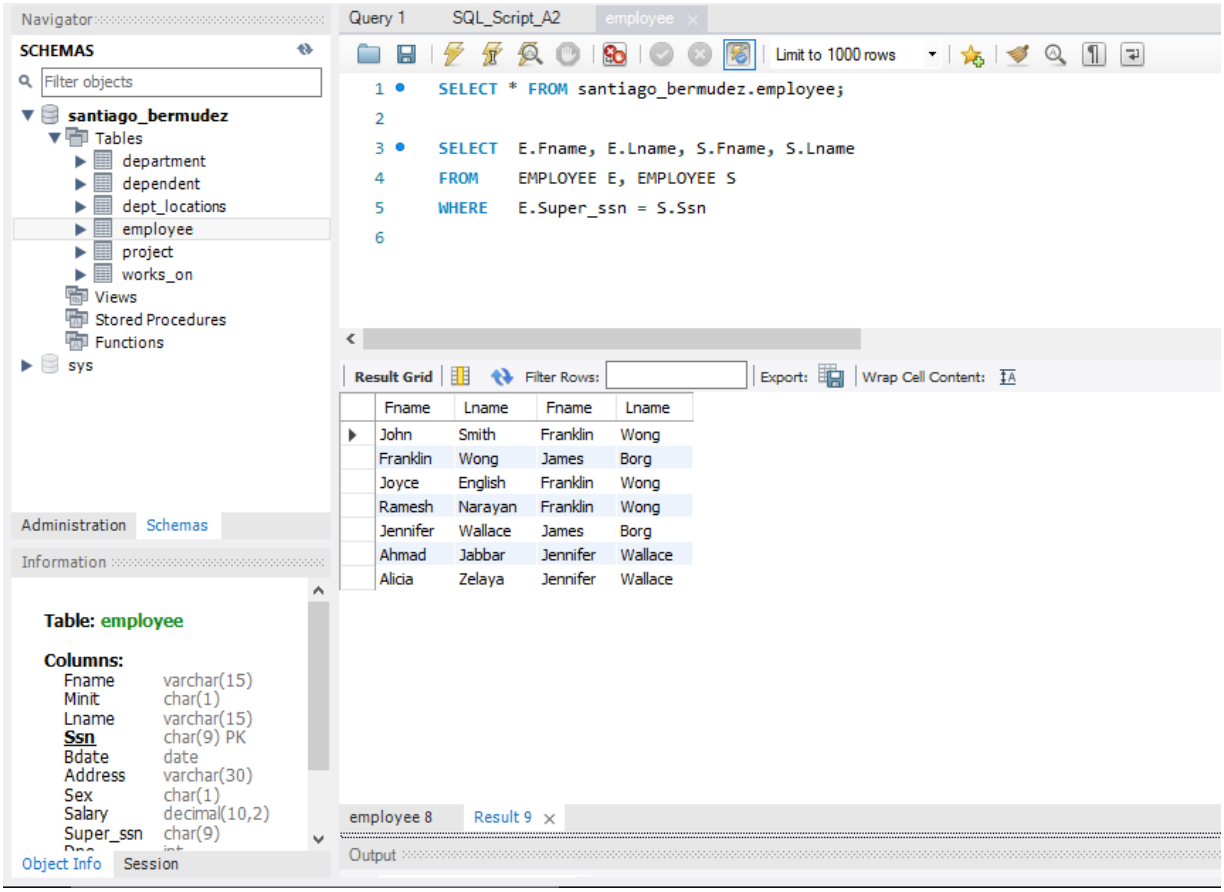
Question 2: (20 pts): For each SQL statement you write for Question 1, do the following:

1. Run it in MySQL workbench and observe the result.
2. Take a screenshot of each returned query result.
3. Copy and paste the four screenshots into your document.

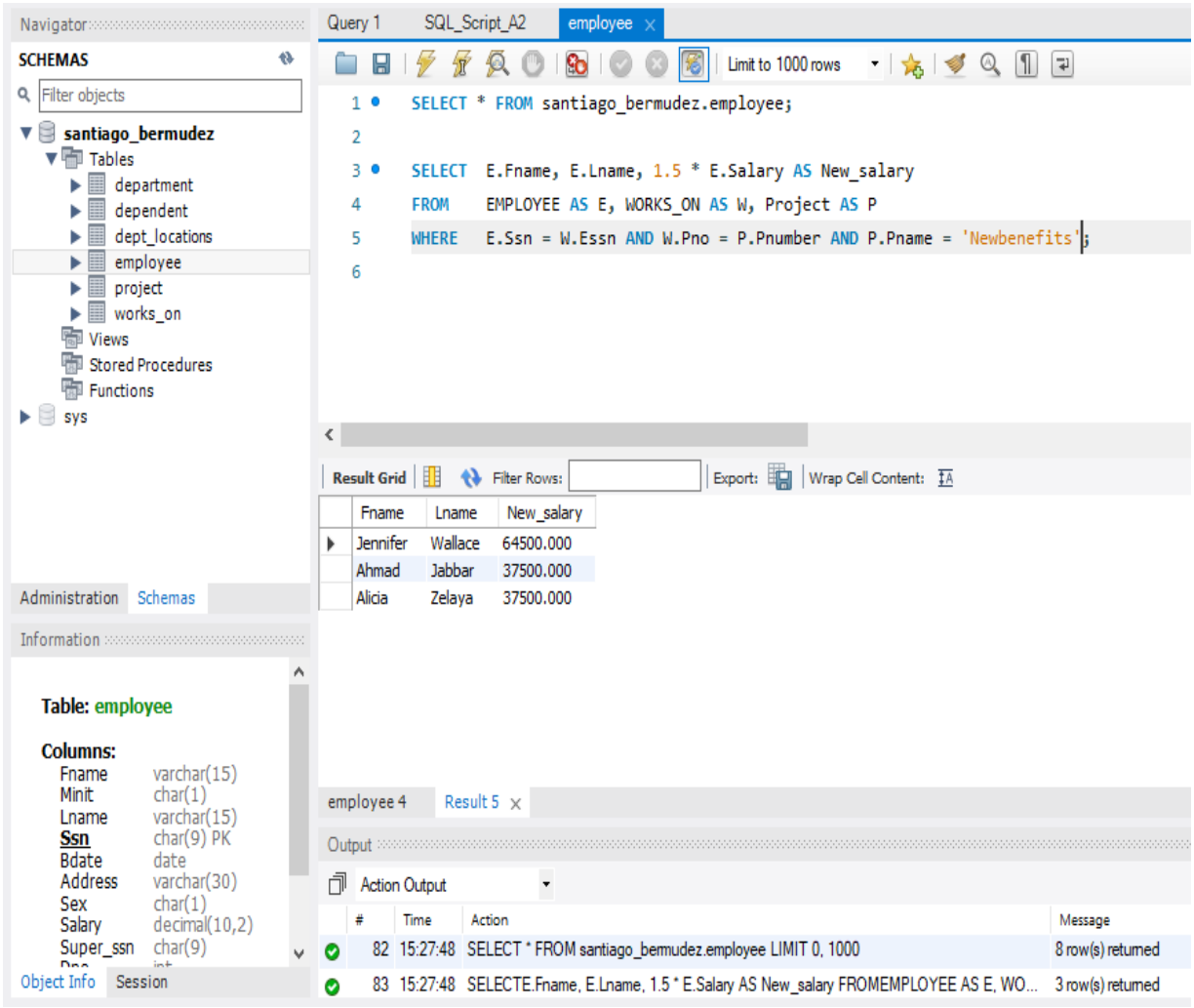
*1.1:



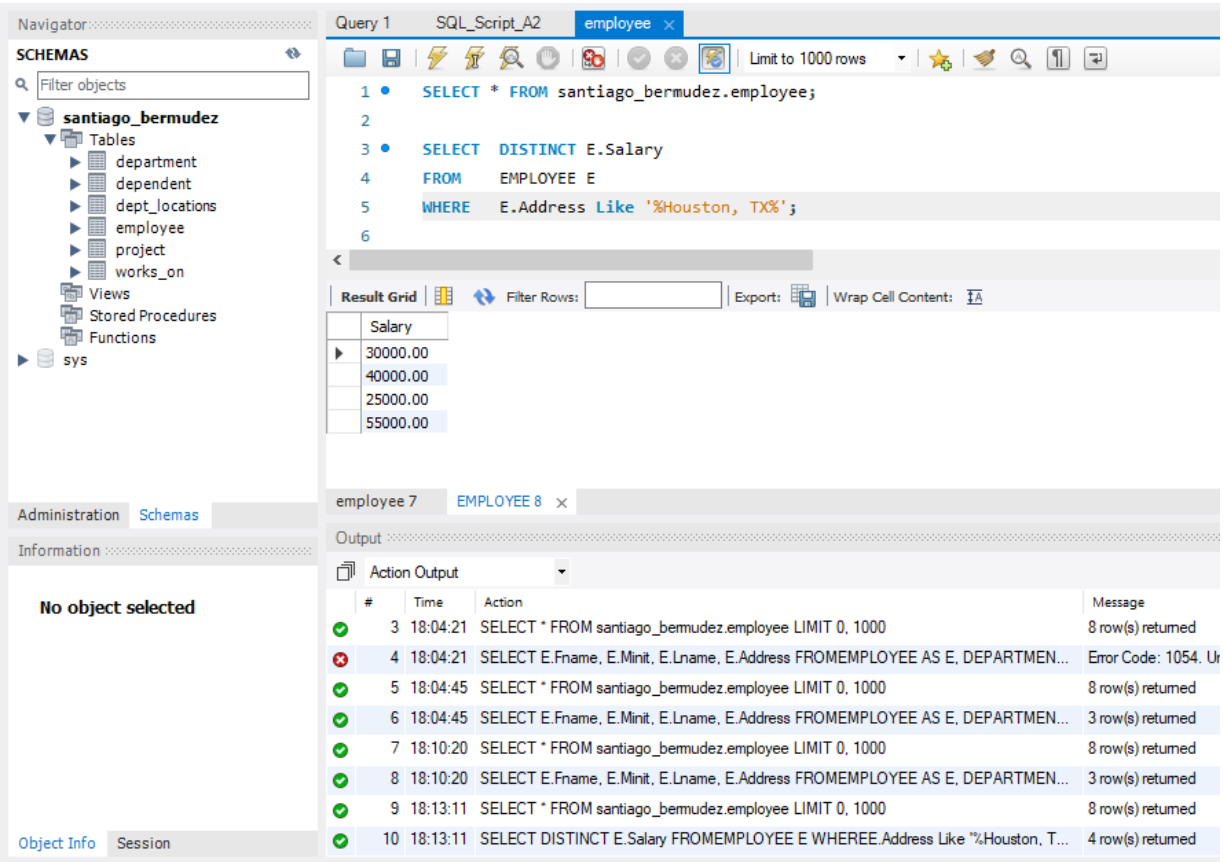
*1.2:


Navigator
SCHEMAS
Filter objects
santiago_bermudez
Tables
department
dependent
dept_locations
employee
project
works_on
Views
Stored Procedures
Functions
sys
Administration
Schemas
Information
Table: employee
Columns:
Fname varchar(15)
Minit char(1)
Lname varchar(15)
Ssn char(9) PK
Bdate date
Address varchar(30)
Sex char(1)
Salary decimal(10,2)
Super_ssn char(9)
Object Info
Session
Query 1
SQL_Script_A2
employee
Limit to 1000 rows
1 SELECT * FROM santiago_bermudez.employee;
2
3 SELECT E.Fname, E.Lname, S.Fname, S.Lname
4 FROM EMPLOYEE E, EMPLOYEE S
5 WHERE E.Super_ssn = S.Ssn
6
Result Grid
Filter Rows:
Export:
Wrap Cell Content:
Fname Lname Fname Lname
John Smith Franklin Wong
Franklin Wong James Borg
Joyce English Franklin Wong
Ramesh Narayan Franklin Wong
Jennifer Wallace James Borg
Ahmad Jabbar Jennifer Wallace
Alicia Zelaya Jennifer Wallace
employee 8
Result 9
Output

*1.3:


Navigator
SCHEMAS
Filter objects
santiago_bermudez
Tables
department
dependent
dept_locations
employee
project
works_on
Views
Stored Procedures
Functions
sys
Administration
Schemas
Information
Table: employee
Columns:
Fname varchar(15)
Minit char(1)
Lname varchar(15)
Ssn char(9) PK
Bdate date
Address varchar(30)
Sex char(1)
Salary decimal(10,2)
Super_ssn char(9)
Object Info
Session
Query 1
SQL_Script_A2
employee
Limit to 1000 rows
1 SELECT * FROM santiago_bermudez.employee;
2
3 SELECT E.Fname, E.Lname, 1.5 * E.Salary AS New_salary
4 FROM EMPLOYEE AS E, WORKS_ON AS W, Project AS P
5 WHERE E.Ssn = W.Essn AND W.Pno = P.Pnumber AND P.Pname = 'Newbenefits';
6
Result Grid
Filter Rows:
Export:
Wrap Cell Content:
Fname Lname New_salary
Jennifer Wallace 64500.000
Ahmad Jabbar 37500.000
Alicia Zelaya 37500.000
employee 4
Result 5
Output
Action Output
Time Action Message
82 15:27:48 SELECT * FROM santiago_bermudez.employee LIMIT 0, 1000 8 row(s) returned
83 15:27:48 SELECTE.Fname, E.Lname, 1.5 * E.Salary AS New_salary FROMEMPLOYEE AS E, WO... 3 row(s) returned

*1.4:



Question 3 (30 points): Please write the SQL statements for the following "modify" operations. (one statement per operation)

Note: please answer all the questions according to SQL syntax but do not run them against your actual database.

3.1 Update the hours attribute of the WORKS_ON tuple with Pno = 10 and Essn='999887777' to 5.0.

UPDATE WORKS_ON

SET Hours = 5.0

WHERE Pno = 10 **AND** Essn = '999887777';

3.2 Insert a new tuple <'Catherine', 'B', 'Priskorn', '123456789', '1980-02-02', 'Riverside Hall 5001, 6000 J St, Sacramento, CA 95819', 'F', 62000, '333445555', 5> into EMPLOYEE table.

INSERT INTO EMPLOYEE

VALUES ('Catherine', 'B', 'Priskorn', '123456789', '1980-02-02', 'Riverside Hall 5001, 6000 J St, Sacramento, CA 95819', 'F',

62000, ‘333445555’, 5);

3.3 Delete the WORKS_ON tuples with Essn = ‘333445555’

DELETE FROM WORKS_ON

WHERE Essn = ‘333445555’;

Question 4 (10 points): There are two integrity constraint violations with the modify operation for question 3.2. Please identify them.

Hint: You may run the statement you write for question 3.2 and check the message returned in the action output window at the bottom of MySQL workbench interface.

One integrity constraint violation is that the address that is being inserted exceeds the 30 character limitation used for address values (*Data too long for ‘Address’ column). Another is that the SSN being inserted has already been used, which is bad as the SSN is supposed to be a primary key that is unique (*Duplicate entry for the primary key of employee).

Deliverables

1. A doc or pdf file containing all your answers.

Requirements on deliverables

1. Your deliverable should be ***FLastname_A2.doc*** or ***FLastname_A2.pdf*** where *F* indicates first letter, in uppercase, of your firstname and *Lastname* indicates your last name where first letter is in uppercase. Please exactly follow the naming rule described above. You will be deducted 5 points for incorrect naming.
2. On the first page, clearly state your name, ID, course title, assignment number, and due date.
3. Submit your doc or pdf file via Canvas.

4. No late submission will be accepted.

5. When grades are returned to you on Canvas, you have 7 days to meet with the instructor for grade changes. Issues and/or disagreements concerning your grade must be resolved in such 7 days window. After 7 days, the grades are written in stone and can't be changed after that point, for whatever reason.