

National University of Computer and Emerging Sciences, Lahore Campus

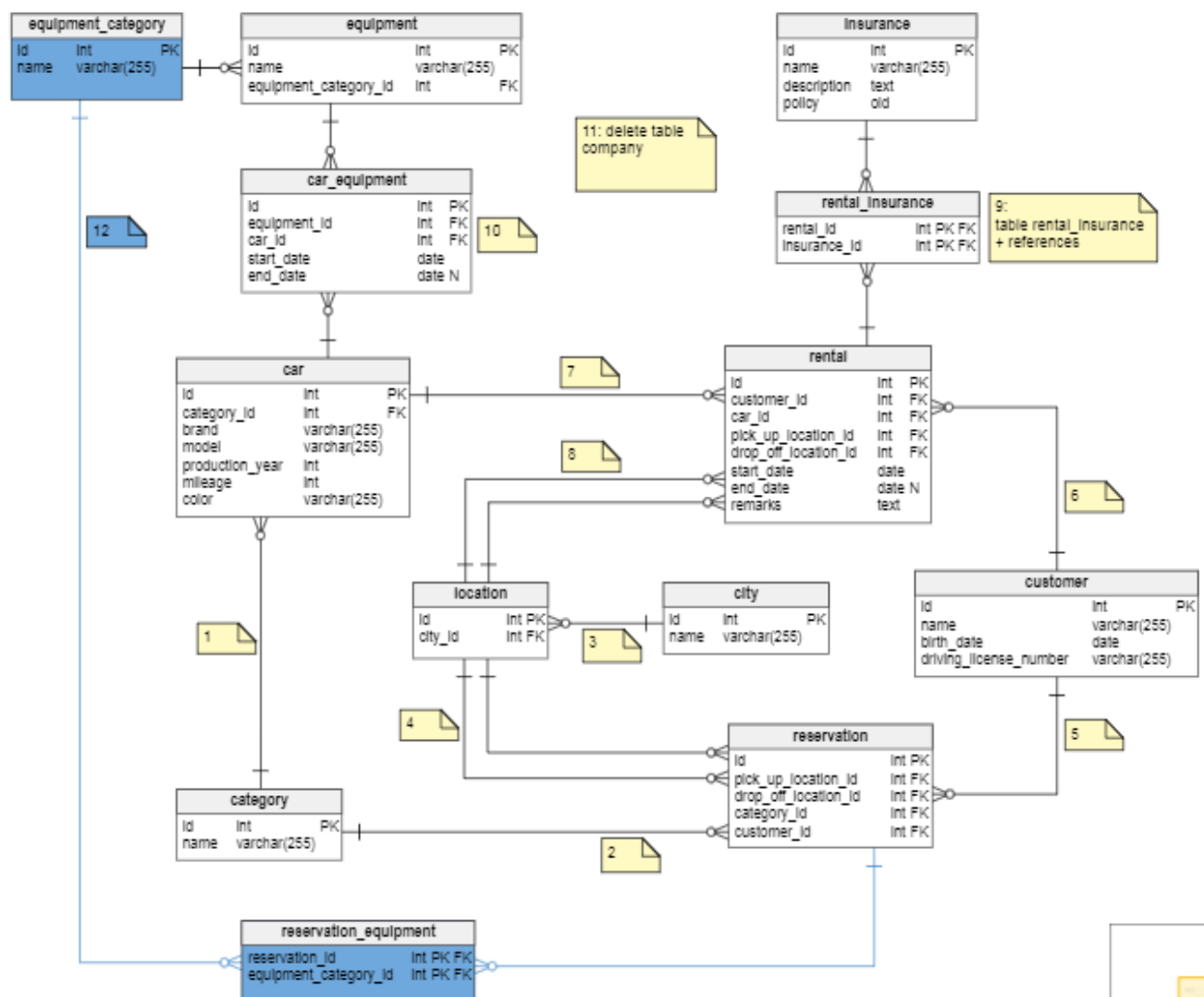


Course:
Program:
Instructor:

Database Systems
BS(Computer Science)
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Practice Problem: Relational Model (1) - **SOLUTION**

Question 1:



Question 3:

R

A	B	C	D	E
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S

F	G	H	I
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T

A	F	H	I
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a. State all the super key(s) for the above relation.

A, B, AB, AC, AD, AE, ABC, ABD, ABE, ACD, ACE, ABCDE, BCD, BCE, BDE, BC, BD, BE, F, FG, FH, FI, FGH, FGI, FHI, FGHI, AF, AFH, AFI, AFHI

b. Mention the super key(s) which are minimal (i.e. key).

A & B in R, F in S, AF in T.

Question 4:

Employee

ID	Name	Salary	Department ID
1	Tom	15000	1
2	Pam	20000	3
3	John	50000	2
4	Sam	60000	3
5	Todd	70000	2
6	Neil	10000	NULL

Department

ID	Department_ Name	Location
1	CS	London
2	EE	NULL
3	BBA	New York
4	Other Department	Sydney

***Consider all questions are Independent.**

1. For Delete

a. Assume that foreign key with cascading option is implemented.

- i. Delete the department(s) whose location is NULL

Department EE will be deleted. All employees who are in EE department will also be deleted.

- ii. Delete the employee(s) whose department id is 3.

The employees with ID 2, 4 will be deleted.

- iii. Delete the department having id equal to 4.

The department having id 4 will be deleted. There will be no change in Employee Table.

b. Assume that foreign key with Set NULL option is implemented.

- i. Delete the department whose location is New York.

ID	Name	Salary	Department ID
1	Tom	15000	1
2	Pam	20000	NULL
3	John	50000	2

4	Sam	60000	NULL
5	Todd	70000	2
6	Neil	10000	NULL

ID	Department_Name	Location
1	CS	London
2	EE	NULL
4	Other Department	Sydney

ii. Delete the department whose department name is CS

ID	Name	Salary	Department ID
1	Tom	15000	NULL
2	Pam	20000	3
3	John	50000	2
4	Sam	60000	3
5	Todd	70000	2
6	Neil	10000	NULL

ID	Department_Name	Location
2	EE	NULL
3	BBA	New York
4	Other Department	Sydney

iii. Delete the employee whose id is 4.

ID	Name	Salary	Department ID
1	Tom	15000	1
2	Pam	20000	3
3	John	50000	2
5	Todd	70000	2
6	Neil	10000	NULL

ID	Department_Name	Location
1	CS	London
2	EE	NULL
3	BBA	New York
4	Other Department	Sydney

iv. Delete all departments.

ID	Name	Salary	Department ID
1	Tom	15000	NULL
2	Pam	20000	NULL
3	John	50000	NULL
4	Sam	60000	NULL
5	Todd	70000	NULL
6	Neil	10000	NULL

ID	Department_Name	Location
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c. Assume that foreign key with no action is implemented.

- i. Delete the department whose location is New York.
Operation not allowed since there are two employees who have this department id.
- ii. Delete the department having id equal to 4.
The department will be deleted. No change in the Employee Table.
- iii. Delete the employee(s) having salary greater than 40000.
All employees having salary greater than 40000 will be deleted. No change in the department table.

2. For Insert

a. Assume that foreign key with cascading option is implemented.

- i. Insert <NULL, 'Physics', 'Tokyo'> into Department.
Operation not allowed since the primary key cannot be null.
- ii. Insert <7, 'George', 54000, 6> into Employee.
Operation not allowed since referential integrity constraint is being violated.
- iii. Insert <8, 'John', 60000 > into Employee.
Operation will be allowed. The department id of the employee will be set to NULL. NO change in the department table.

b. Assume that foreign key with set NULL is implemented.

- i. Insert <4, 'Ali', 100000, 2> into Employee.
Operation not allowed because primary key constraint is being violated.
- ii. Insert <NULL, 'Hameed', 80000,1> into Employee.
Operation not allowed since primary cannot be NULL.
- iii. Insert <5, 'Physics', 'Karachi' > into Department.
The department will be inserted. No change in the employee table.
- iv. Insert < '7' , 'Mathematics', 'Sydney'> into Department.

Operation allowed. Character type will be converted to integer by sql.

c. Assume that foreign key with No Action is implemented.

- i. Insert <7, 'Ali', 40000> into Employee.

Operation allowed. The department id of this employee will be set to NULL.

- ii. Insert <10, 'Umer', 60000, 6> into Employee.

Operation not allowed since referential integrity constraint is being violated.

- iii. Insert <3, 'Physics', 'New York', 1>

Operation not allowed since primary key constraint is being violated.

3. For Update

a. Assume that foreign key with cascading option is implemented

- i. For the department having id=4, change the id to 3.

Operation not allowed since primary key constraint is being violated.

- ii. For the department having id=1, change the location to Karachi.

The location of department will be changed from Sydney to Karachi. No change in the employee table.

- iii. For the employee having id=1, change the id to 8.

The id of the employee will be changed from 1 to 8. No change in the department table.

- iv. For the department having id=3, change the id to 10.

ID	Name	Salary	Department ID
1	Tom	15000	1
2	Pam	20000	10
3	John	50000	2
4	Sam	60000	10
5	Todd	70000	2
6	Neil	10000	NULL

ID	Department_ Name	Location
1	CS	London
2	EE	NULL
10	BBA	New York
4	Other Department	Sydney

b. Assume that foreign key with set NULL option is implemented.

- i. For the department having id=1, change the id to 8.

ID	Name	Salary	Department ID
1	Tom	15000	NULL
2	Pam	20000	3
3	John	50000	2
4	Sam	60000	3
5	Todd	70000	2
6	Neil	10000	NULL

ID	Department_ Name	Location
8	CS	London
2	EE	NULL
3	BBA	New York
4	Other Department	Sydney

- ii. For department having location as NULL, change the id to 4.

Operation not allowed since primary key constraint is being violated.

- iii. For the department having name='BBA', change the name to 'Mathematics'.

The name will be changed. No change in the Employee table.

c. Assume that foreign key with no Action is implemented.

- i. For department having department name as NULL, update the department name to 'Karachi'.

The name will be changed. No change in the Employee table.

- ii. For department having department id=4, update the department id to 3.

Operation not allowed since primary key constraint is being violated.

- iii. For department having department id= 1, update the department id to 10.

Operation not allowed since there is an employee whose department id is 1.

- iv. For department having department id=4, update the department id to 6

. *Operation allowed. No change in the employee table.*