National University

OfComputer&EmergingSciencesFaisalabad-ChiniotCampus

Assignment # 5

CS 2005 – Database Systems Spring 2023

Submission Guidelines

1. You must submit .doc or .docs or .PDF file on the classroom having name 21F-XXXX.
2. Word file must be properly formatted.
3. Late submission is strictly not allowed.
4. Follow the deadline mentioned on classroom

Use these tables and write their equations

emp_id	emp_name	emp_salary	dept_id
1	Alice	50000	1
2	Bob	60000	2
3	Charlie	70000	1
4	David	55000	2
5	Eve	65000	3

dept_id	dept_name
1	Sales
2	Marketing
3	HR
4	IT

proj_id	proj_name	budget
1	Project1	50000
2	Project2	75000
3	Project3	100000

emp_id	proj_id
1	1
1	2
2	1
2	2
2	3
3	2

Question # 1 : Relational Algebra

1. What are the names of all employees in the Sales department?
2. What are the names of all employees who are working on Project1?
3. What are the names of all employees who are not working on any project?
4. Which departments have at least one employee working on a project with a budget greater than $75,000?
5. What is the total budget for all projects?
6. What is the highest salary in the Marketing department?
7. What is the average salary of employees working on projects in the Sales department?
8. What is the number of employees working on each project?

Question # 2: Relational Algebra and SQL

Convert the following equations into SQL queries

1. π emp_name ((Departments ⋈ Employees) ⋈ σ dept_name='Sales'(Departments))
2. π emp_name ((Employees) ⋈ Assignments)
3. π emp_name (Employees - π emp_id (Assignments))

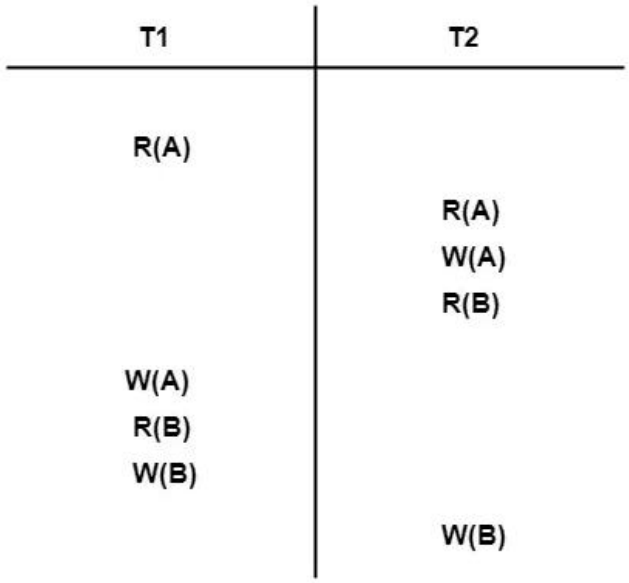
Question # 3: Transactions

Draw the precedence graph and show if the schedule conflict-serializable or not.

T1	T2	T3	T4
	R(X)		
		W(X)	
		Commit	
W(X)			
Commit			
	W(Y)		
	R(Z)		
	Commit		
			R(X)
			R(Y)
			Commit

Question # 4: Transactions

Show if the schedule conflict-serializable or not. Also tell only the name of ACID properties which are violated by the following Schedule.



Question # 5: Transactions

Show if the schedule conflict-serializable or not. Also tell only the name of ACID properties which are violated by the following Schedule

T1	T2
read(A)	
read(B)	
A := A − 50	
write(A)	
	read(B)
	B := B − 10
	write(B)
B := B + 50	
write(B)	
	read(A)
	A := A + 10
	write(A)