

East West University  
Dept. of Computer Science and Engineering  
CSE302: Database Systems (Section 6)

Quiz - I (Fall 2024)

Full Marks: 10

Time: 30 Minutes

Student ID	Name
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Consider the database instance given in Appendix.  
Generate the Relational Algebra Expressions for the following queries. (1 X 10 = 10 points)

1. Find the name of employees who are male.

$\pi_{name}(\sigma_{gender='Male'}(Employees))$

2. Select all project details managed by Alice.

$\sigma_{manager='Alice'}(Projects)$

3. Find the total number of hours worked by Charlie on all projects.

$\sigma_{name='Charlie'}(Employee \bowtie Assignments)$   
 $\rightarrow \sum(hoursworked)$

4. Find the employee names and genders who worked on Project E.

$\pi_{name, gender}(\sigma_{projectName='Project E'}(Employee \bowtie Assignments))$

5. List the names of employees who hold the dual role of being an employee and a manager.

$$\pi_{name} (\sigma_{name=manager} (E \bowtie P))$$

OR  $\pi_{name}(E) \cap \pi_{name}(P)$

6. Select the names of employees who have worked on both Project A and Project D.

$$\pi_{name} (\sigma_{projectName = 'Project A'} (E \bowtie P))$$

$\cap$   $\sigma_{projectName = 'Project D'}$

7. Select the names of employees who have not worked on any project.

$$\pi_{name} (Employees \setminus (\pi_{EID}(Employees) \setminus \pi_{EID}(Assigned)))$$

OR  $\pi_{name}(Employees) \setminus \pi_{name}(E \bowtie P)$

8. Calculate the average working hours of female employees.

$$\pi_{AVG(wH)} (\sigma_{gender = 'Female'} (E \bowtie P))$$

Find the employee (ID) who worked on all projects.  
 [Output might be NULL but you need to write the relational algebra correctly]

$$\pi_{\text{eid}} \left( \text{Assignments} \div \pi_{\text{projectID}} (\text{Projects}) \right)$$

10. Find the employee name and project name for the assignment with the most hours worked.

$$\begin{aligned} \text{MHW} &\leftarrow \sigma_{\text{MAX}(\text{hours worked})} (\text{Assignment}) \\ \pi_{\text{name, projectname}} &\left( \sigma_{\text{hours worked} = \text{MHW}} (\text{EXAMP}) \right) \end{aligned}$$