LAB 1
RELATIONAL ALGEBRA

Questions	1	2	3	4	5	6	7
Grade							

Employees

EmployeeID	Name	Department
1	John	HR
2	Sarah	IT
3	Michael	Finance
4	Emma	IT

Assignments

EmployeeID	ProjectID
1	201
1	204
2	202
3	203
4	202

Projects

ProjectID	ProjectName	Budget
201	Project Alpha	50000
202	Project Beta	75000
203	Project Gamma	30000
204	Project Delta	60000

Managers

ManagerID	Name	Department
M1	Alice	HR
M2	Bob	IT
M3	Carol	Finance

Questions

1) Retrieve the names of all employees in the "IT" department. **(2 point)**

$$\pi_{\text{Name}}(\sigma_{\text{Department}='\text{IT}'}(\text{Employees}))$$

2) List the project names and their budgets for projects that have a budget greater than 50000. **(1 point)**

$$\pi_{\text{ProjectName, Budget}}(\sigma_{\text{Budget}>50000}(\text{Projects}))$$

3) Find the names of employees who are assigned to the "Project Beta." **(1 point)**

$$\pi_{\text{Name}}(\text{Employees} \bowtie (\sigma_{\text{ProjectName}='\text{Project Beta}'}(\text{Assignments} \bowtie \text{Projects})))$$

4) Identify the names of all managers in the "HR" department. **(1 point)**

$$\pi_{\text{Name}}(\sigma_{\text{Department}='\text{HR}'}(\text{Managers}))$$

5) Get the list of employees assigned to projects with a budget of less than 40000. **(2 point)**

$$\pi_{\text{Name}}(\text{Employees} \bowtie (\text{Assignments} \bowtie \sigma_{\text{Budget}<40000}(\text{Projects})))$$

6) Find the total budget of projects that John is assigned to. **(1 point)**

$$\gamma_{\text{SUM(Budget)}}(\text{Projects} \bowtie \text{Assignments} \bowtie \sigma_{\text{Name}='\text{John}'}(\text{Employees}))$$

7) List the names of employees who are assigned to projects managed by Bob. **(2 point)**

$$\pi_{\text{Name}}(\text{Employees} \bowtie \text{Assignments} \bowtie (\text{Projects} \bowtie \sigma_{\text{Name}='\text{Bob}'}(\text{Managers})))$$