

Consider the following relations:

Employees (Emp#, Name, Job, Start_Date, Salary, Bonus, Dept#)

key(Employees) = Emp#

foreign-key(Employees) = Dept#

(referenced relation: Departments)

Departments(Dept#, Name_Dept, Office#, Division#, Manager)

key (Departments) = Dept#

Write the following queries in Relational Algebra:

1. Find the names of all employees
2. Find the employees named Brown
3. Find all department names
4. Find the employees that started in the year 1999
5. Find the office of department number 30
6. Find the number and job of employees that work in department 30
7. Find the department name of the department of employees named Verdi
8. Find the office number and manager of employees that make more than 40k.

Solutions

1. $\pi_{\text{Name}} (\text{Employees})$
2. $\sigma_{\text{Name} = \text{'Brown'}} (\text{Employees})$
3. $\pi_{\text{Name_Dept}} (\text{Departments})$
4. $\sigma_{1.1.1999 \leq \text{Start_Date} \leq 31.12.1999} (\text{Employees})$
5. $\pi_{\text{Office}} (\sigma_{\text{Dept\#} = \text{'30'}} (\text{Departments}))$
6. $\pi_{\text{Emp\#, Job}} (\sigma_{\text{Dept\#} = \text{'30'}} (\text{Employees}))$
7. $\pi_{\text{Name_Dept}} (\text{Departments} \bowtie \sigma_{\text{Name} = \text{'Verdi'}} (\text{Employees}))$
8. $\pi_{\text{Office, Manager}} (\sigma_{\text{Salary} > 40k} (\text{Employees}) \bowtie \text{Departments})$

NOTE: \bowtie indicates the natural join operator, i.e., a join based on the equality of common attributes (in this case the common attribute is Dept#)