Lab05

Grupo - **P2G2**

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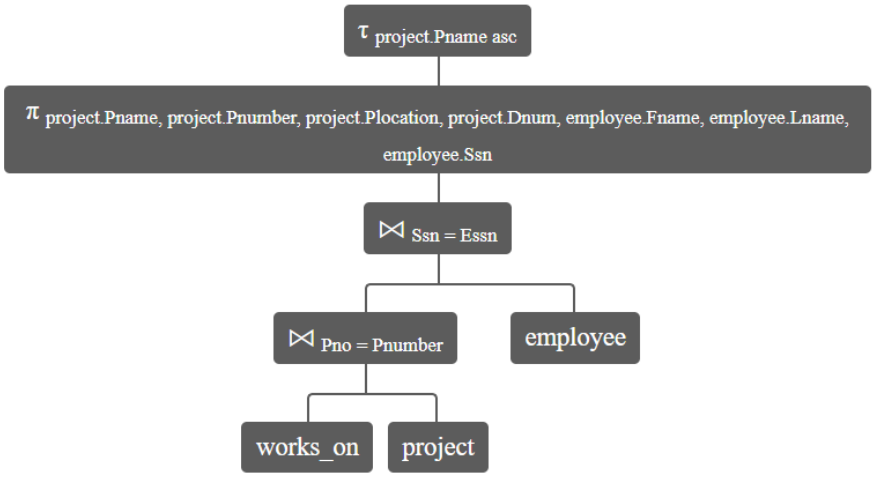
Exercicio 1

a)

> π project.Pname, project.Pnumber, project.Plocation, project.Dnum, employee.Fname, employee.Lname, employee.Ssn works_on ⋈ Pno = Pnumber project ⋈ Ssn = Essn employee

```
SELECT project.*, employee.Fname, employee.Lname, employee.Ssn
FROM works_on
INNER JOIN project on Pno=Pnumber
INNER JOIN employee on Ssn=Essn
```



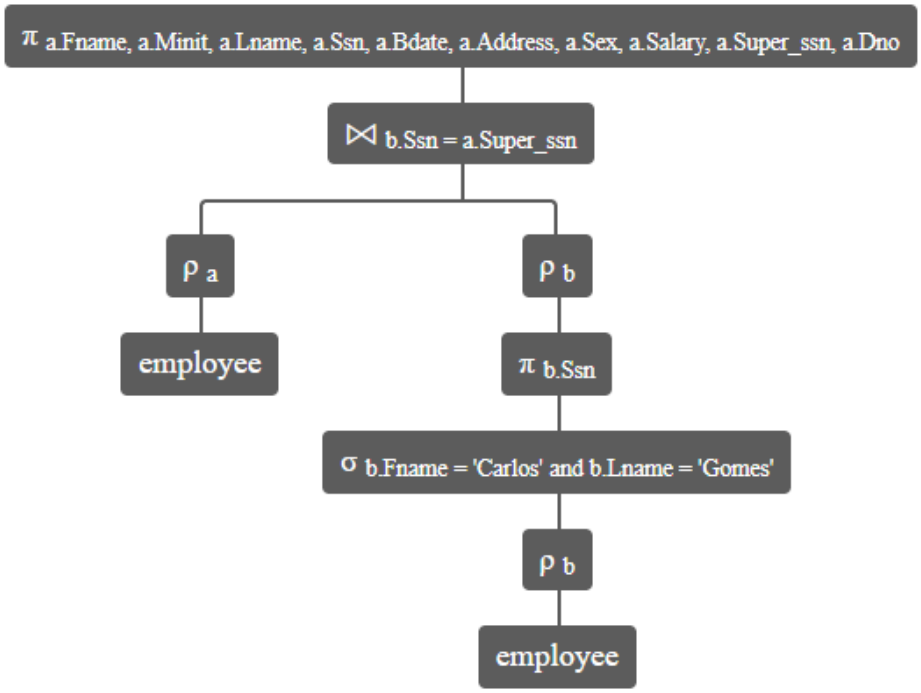
τ project.Pname asc π project.Pname, project.Pnumber, project.Plocation, project.Dnum, employee.Fname, employee.Lname, employee.Ssn works_on ⋈ Pno = Pnumber project ⋈ Ssn = Essn employee

project.Pname	project.Pnumber	project.Plocation	project.Dnum	employee.Fname	employee.Lname	employee.Ssn
Aveiro Digital	1	Aveiro	3	Paula	Sousa	183623612
Aveiro Digital	1	Aveiro	3	Carlos	Gomes	21312332
Aveiro Digital	1	Aveiro	3	Juliana	Amaral	321233765
Aveiro Digital	1	Aveiro	3	Maria	Pereira	342343434
BD Open Day	2	Espinho	2	Joao	Costa	41124234
Dicoogle	3	Aveiro	3	Paula	Sousa	183623612
Dicoogle	3	Aveiro	3	Joao	Costa	41124234
GOPACS	4	Aveiro	3	Maria	Pereira	342343434

b)

> π a.Fname, a.Minit, a.Lname, a.Ssn, a.Bdate, a.Address, a.Sex, a.Salary, a.Super_ssn, a.Dno ρ a employee ⋈ b.Ssn = a.Super_ssn ρ b π b.Ssn σ b.Fname = 'Carlos' and b.Lname = 'Gomes' ρ b employee

```
SELECT a.*
FROM employee AS a
INNER JOIN (
    SELECT b.Ssn
    FROM employee as b
    WHERE b.Fname='Carlos' AND b.Lname='Gomes')
AS b
ON b.Ssn = a.Super_ssn;
```



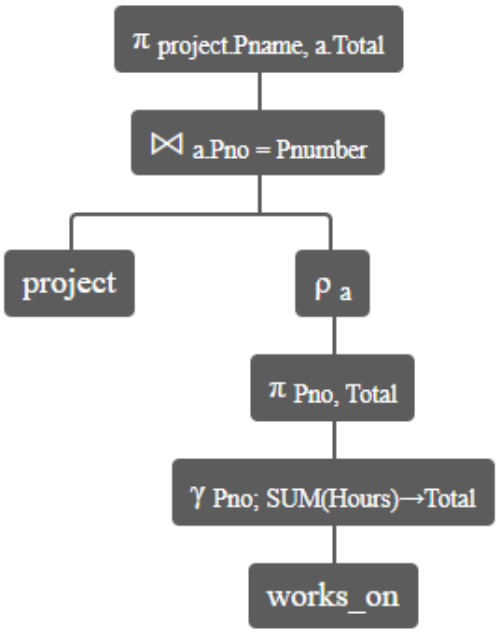
π a.Fname, a.Minit, a.Lname, a.Ssn, a.Bdate, a.Address, a.Sex, a.Salary, a.Super_ssn, a.Dno ρ a employee ⋈ b.Ssn = a.Super_ssn ρ b π b.Ssn σ b.Fname = 'Carlos' and b.Lname = 'Gomes' ρ b employee

a.Fname	a.Minit	a.Lname	a.Ssn	a.Bdate	a.Address	a.Sex	a.Salary	a.Super_ssn	a.Dno
Maria	I	Pereira	342343434	2001-05-01	Rua JANOTA	F	1250	21312332	2
Joao	G	Costa	41124234	2001-01-01	Rua YGZ	M	1300	21312332	2
Ana	L	Silva	12652121	1990-03-03	Rua ZIG ZAG	F	1400	21312332	2

c)

> π project.Pname, a.Total project ⋈ a.Pno = Pnumber ρ a π Pno, Total γ Pno; SUM(Hours)→Total works_on

```
SELECT project.Pname, a.Total
FROM project
INNER JOIN (
    SELECT Pno, SUM(Hours) AS Total
    FROM works_on
    GROUP BY Pno)
AS a
ON (a.Pno=Pnumber);
```



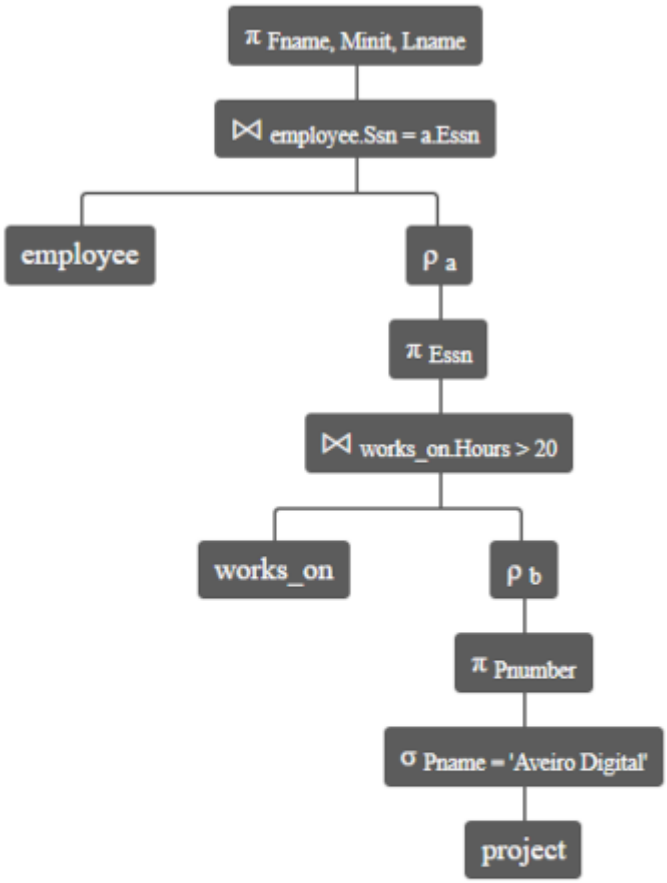
π project.Pname, a.Total project ⋈ a.Pno = Pnumber ρ a π Pno, Total γ Pno; SUM(Hours)→Total works_on

project.Pname	a.Total
Aveiro Digital	85
BD Open Day	20
Dicoogle	40
GOPACS	25

d)

> π Fname, Minit, Lname employee ⋈ employee.Ssn = a.Essn ρ a π Essn works_on ⋈ works_on.Hours > 20 ρ b π Pnumber σ Pname = 'Aveiro Digital' project

```
SELECT Fname, Minit, Lname
FROM employee
INNER JOIN (
    SELECT Essn
    FROM works_on
    INNER JOIN (
        SELECT Pnumber
        FROM project
        WHERE Pname='Aveiro Digital')
    AS b
    ON works_on.Hours > 20)
AS a
ON employee.Ssn = a.Essn
```



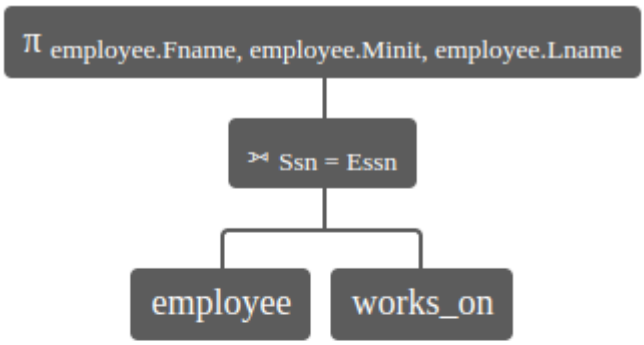
π Fname, Minit, Lname employee ⋈ employee.Ssn = a.Essn ρ a π Essn works_on ⋈ works_on.Hours > 20 ρ b π Pnumber σ Pname = 'Aveiro Digital' project

employee.Fname	employee.Minit	employee.Lname
Juliana	A	Amaral
Maria	I	Pereira
Joao	G	Costa

e)

> π employee.Fname, employee.Minit, employee.Lname employee ⋈ Ssn = Essn works_on

```sql
SELECT employee.Fname, employee.Minit, employee.Lname
FROM employee
LEFT JOIN works_on
ON Ssn=Essn
WHERE Essn IS NULL;
```



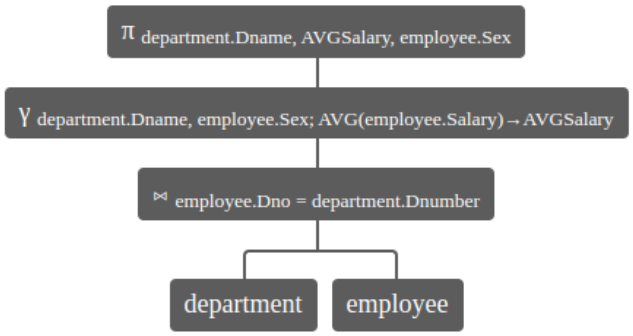
π employee.Fname, employee.Minit, employee.Lname employee $\bowtie$ Ssn = Essn works_on

employee.Fname	employee.Minit	employee.Lname
Paula	A	Sousa
Carlos	D	Gomes
Juliana	A	Amaral
Maria	I	Pereira
Joao	G	Costa
Ana	L	Silva

f)

> π department.Dname, AVGSalary, employee.Sex γ department.Dname, employee.Sex; AVG(employee.Salary)→AVGSalary department ⋈ employee.Dno = department.Dnumber employee

```
SELECT department.Dname, AVG(employee.Salary) AS AVGSalary, employee.Sex
FROM department
INNER JOIN employee
ON employee.Dno=department.Dnumber
GROUP BY department.Dname, employee.Sex;
```



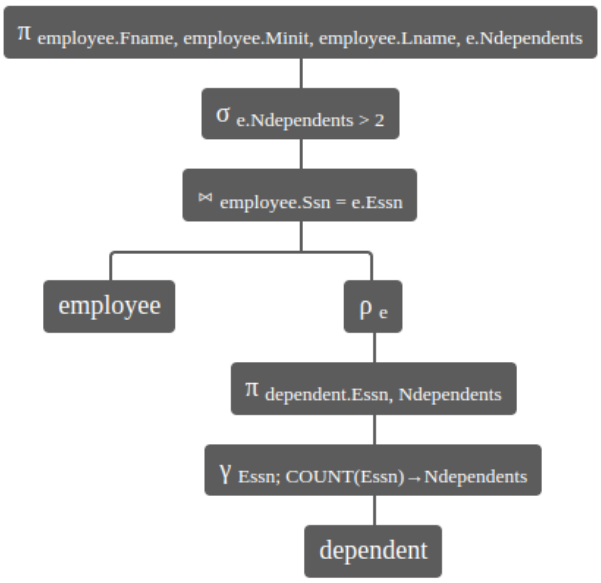
π department.Dname, AVGSalary, employee.Sex γ department.Dname, employee.Sex; AVG(employee.Salary)→AVGSalary department ⋈ employee.Dno = department.Dnumber employee

department.Dname	AVGSalary	employee.Sex
Investigacao	1200	M
Comercial	1325	F
Comercial	1300	M
Logistica	1400	F

g)

> π employee.Fname, employee.Minit, employee.Lname, e.Ndependents σ e.Ndependents > 2 employee ⋈ employee.Ssn = e.Essn ρ e π dependent.Essn, Ndependents γ Essn; COUNT(Essn)→Ndependents dependent

```
SELECT employee.Fname, employee.Minit, employee.Lname, e.Ndependents
FROM employee
INNER JOIN (
 SELECT dependent.*, COUNT(Essn) AS Ndependents
 FROM dependent
 GROUP BY Essn
) AS e
ON employee.Ssn = e.Essn
WHERE e.Ndependents>2;
```



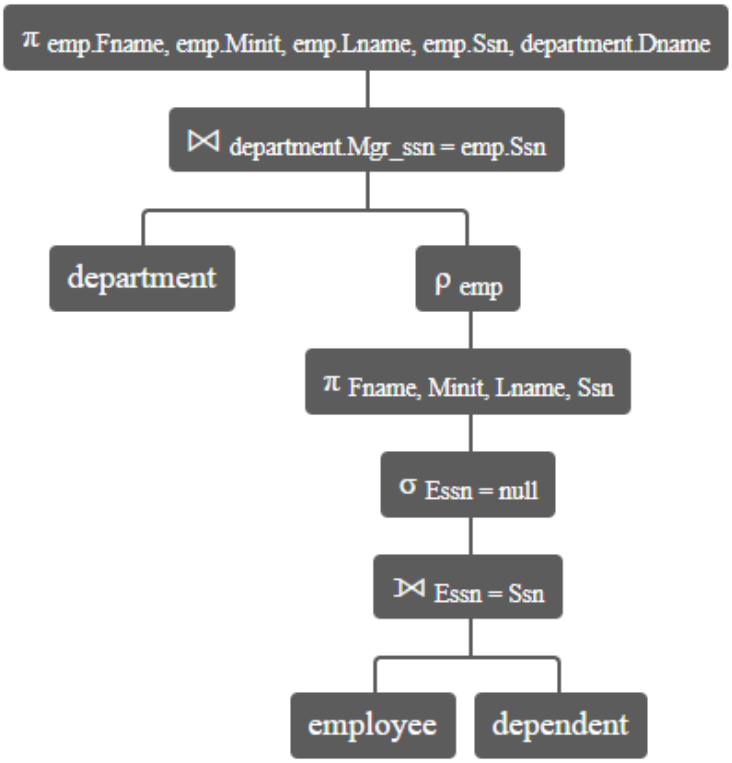
π employee.Fname, employee.Minit, employee.Lname, e.Ndependents σ e.Ndependents > 2 employee ⋈ employee.Ssn = e.Essn ρ e π dependent.Essn, Ndependents γ Essn; COUNT(Essn)→Ndependents dependent

employee.Fname	employee.Minit	employee.Lname	e.Ndependents
Carlos	D	Gomes	3

h)

> π emp.Fname, emp.Minit, emp.Lname, emp.Ssn, department.Dname department ⋈ department.Mgr_ssn = emp.Ssn ρ emp π Fname, Minit, Lname, Ssn σ Essn = null employee ⋈ Essn = Ssn dependent

```
SELECT emp.*, department.Dname
FROM department
INNER JOIN (
 SELECT Fname, Minit, Lname, Ssn
 FROM employee
 LEFT JOIN dependent
 ON Essn=Ssn
 WHERE Essn IS NULL
)
AS emp
ON department.Mgr_ssn=emp.Ssn;
```



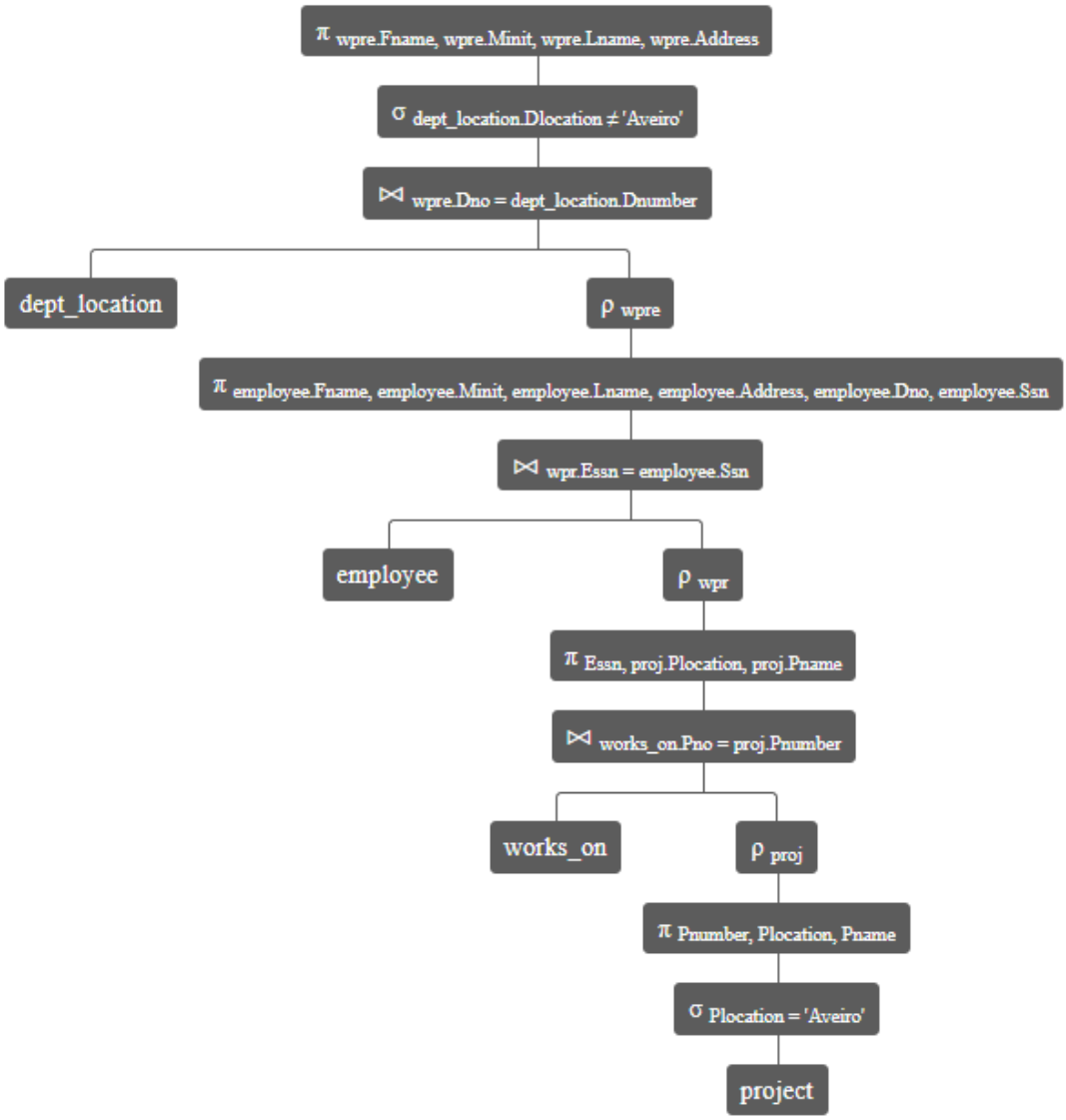
π emp.Fname, emp.Minit, emp.Lname, emp.Ssn, department.Dname department ⋈ department.Mgr_ssn = emp.Ssn ρ emp π Fname, Minit, Lname, Ssn σ Essn = null employee ⋈ Essn = Ssn dependent

emp.Fname	emp.Minit	emp.Lname	emp.Ssn	department.Dname
Ana	L	Silva	12652121	Recursos Humanos

i)

> π wpre.Fname, wpre.Minit, wpre.Lname, wpre.Pname, wpre.Plocation, dept_location.Dlocation σ dept_location.Dlocation ≠ 'Aveiro' dept_location ⋈ wpre.Dno = dept_location.Dnumber ρ wpre π employee.Fname, employee.Minit, employee.Lname, employee.Dno, wpr.Pname, wpr.Plocation employee ⋈ wpr.Essn = employee.Ssn ρ wpr π Essn, proj.Plocation, proj.Pname works_on ⋈ works_on.Pno = proj.Pnumber ρ proj π Pnumber, Plocation, Pname σ Plocation = 'Aveiro' project

```
SELECT wpre.Fname, wpre.Minit, wpre.Lname, wpre.Address
FROM dept_location
INNER JOIN (
    SELECT
        employee.Fname,
        employee.Minit,
        employee.Lname,
        employee.Address,
        employee.Dno,
        employee.Ssn
    FROM employee
    INNER JOIN (
        SELECT Essn, proj.Plocation, proj.Pname
        FROM works_on
        INNER JOIN (
            SELECT Pnumber, Plocation, Pname
            FROM project
            WHERE Plocation='Aveiro')
        AS proj
        ON works_on.Pno=proj.Pnumber)
    AS wpr
    ON wpr.Essn=employee.Ssn)
AS wpre
ON wpre.Dno=dept_location.Dnumber
WHERE dept_location.Dlocation!='Aveiro'
```



π wpre.Fname, wpre.Minit, wpre.Lname, wpre.Address σ dept_location.Dlocation ≠ 'Aveiro' dept_location ⋈ wpre.Dno = dept_location.Dnumber ρ wpre π employee.Fname, employee.Minit, employee.Lname, employee.Address, employee.Dno, employee.Ssn employee ⋈ wpr.Essn = employee.Ssn ρ wpr π Essn, proj.Plocation, proj.Pname works_on ⋈ works_on.Pno = proj.Pnumber ρ proj π Pnumber, Plocation, Pname σ Plocation = 'Aveiro' project

wpre.Fname	wpre.Minit	wpre.Lname	wpre.Address
Paula	A	Sousa	Rua da FRENTE
Juliana	A	Amaral	Rua BZZZZ