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CS2300
Homework 4
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1.a.

$Px \leftarrow \sigma(Pname = 'ProductX')(PROJECT)$
$W\_Px \leftarrow \sigma(Pno = Pnumber \wedge hours > 10)(Px \times W\_Px)$
$Solution \leftarrow \sigma(Fname \wedge Flast \wedge ssn = Essn \wedge Dno = 5)\,(W\_Px \times EMPLOYEE)$

1.b.

$Depen \leftarrow \pi(dependent\_name \wedge Essn)(DEPENDENT)$
$Emp \leftarrow \pi(Fname \wedge Lname \wedge ssn)(EMPLOYEE)$
$Depen\_Emp \leftarrow \sigma(dependent\_name = Fname \wedge ssn = Essn)(Emp \times Depen)$
$Solution \leftarrow \pi(Fname \wedge Lname)(Depen\_Emp)$

1.c.

$Frank \leftarrow \pi(Fname = 'Frank' \wedge Lname = 'Wong' \wedge ssn)(EMPLOYEE)$
$Employ \leftarrow \pi(Fname \wedge Lname \wedge super\_ssn)(EMPLOYEE)$
$Frank\_Employeee \leftarrow \sigma(Fname \wedge Lname \wedge super\_ssn = ssn)(Frank \times Employ)$
$Solution \leftarrow \pi(Fname \wedge Lname)(Frank\_Employee)$

1.d.

$Proj \leftarrow \pi(Pname \wedge Pnumber)(PROJECT)$
$W \leftarrow Pno\, F_{sumHours})(WORKS\_ON)$
$W\_Proj \leftarrow \sigma(Pnumber = Pno)(Proj \times W)$
$Solution \leftarrow \pi(Pname \wedge sumHours)(W\_Proj)$

1.e.

$Tp \leftarrow (F_{countPno})(PROJECTS)$
$E\_P \leftarrow (Essn\, F_{countPno})(WORKS\_ON)$
$temp \leftarrow \sigma(countPno = countPnumber)(Tp \times E\_P)$
$Solution \leftarrow \pi(Fname \wedge Lname)\sigma(Essn = Ssn(Temp \times EMPLOYEE))$

1.f.

$SSN\_LIST \leftarrow \rho(Essn)(\pi\, Ssn(EMPLOYEE))$
$Working \leftarrow \pi\, Essn(WORKS\_ON)$
$NOT \leftarrow SSN\_LIST - Working$
$Solution \leftarrow \pi(Fname \wedge Lname)(\sigma(Ssn = Essn))(EMPLOYEE \times NOT)$

1.g.

$avgSale \leftarrow Dno\, F_{averageSalary}(EMPLOYEE)$

$Solution \leftarrow \pi(Dname \wedge averageSalary)(\sigma(Dno = Dnumber(avgSal \times DEPARTMENT)))$

1.h.

$girls \leftarrow \sigma(sex = 'Female')(EMPLOYEE)$

$Solution \leftarrow F_{averageSalary}(girls)$

2.

$R_1 \leftarrow \pi(mid, aid, title, year)\, \sigma(mid = id\,(Movie \times STARS\_IN))$

$R_2 \leftarrow \pi(id, name, year - birthyear, title, year\,)(Actor \bowtie_{id = aid} M\_S)$

$R_3 \leftarrow \rho(id, name, age, title, year)\,(R_2)$

$R_4 \leftarrow \rho(aid, max\_age)\,(F_{MAXage}(R_3))$

$R_5 \leftarrow R_3 \bowtie_{id = aid \wedge age = max\_age} R_4$

$R_6 \leftarrow \pi_{name, age, title, year} R_5$

$Solution \leftarrow \rho(ActorLatestMovie(actor\_name, age\_during\_movie, latest\_movie\_title, movie\_year) R_6$