

CS3402 Tutorial 5:

1. **Answer:**(a) $T1 \times T2$

P	Q	R1	A	B	R2
10	a	5	10	b	6
10	a	5	25	c	3
10	a	5	10	b	5
15	b	8	10	b	6
15	b	8	25	c	3
15	b	8	10	b	5
25	a	6	10	b	6
25	a	6	25	c	3
25	a	6	10	b	5

(b) $T1 \bowtie_{T1.P=T2.A} T2$

P	Q	R1	A	B	R2
10	a	5	10	b	6
10	a	5	10	b	5
25	a	6	25	c	3

(c) $T1 \bowtie_{T1.Q=T2.B} T2$

P	Q	R1	A	B	R2
15	b	8	10	b	6
15	b	8	10	b	5

(d) $T1 \bowtie_{T1.R>T2.R} T2$

P	Q	R1	A	B	R2
15	b	8	10	b	6
15	b	8	25	c	3
15	b	8	10	b	5
25	a	6	25	c	3
25	a	6	10	b	5
10	a	5	25	c	3

(e) $T1 * T2$

P	Q	R	A	B
10	a	5	10	b
25	a	6	10	b

2. **Answer:**

- (a) Find the SSn (social security number) of all employees who are not supervisors

$$\pi_{ssn}(\text{EMPLOYEE}) - \pi_{super_ssn}(\text{EMPLOYEE})$$

- (b) Find the SSn of all employees who either work in department 5 or directly supervise an employee who works in department 5

$$\pi_{ssn}(\sigma_{Dno=5}(\text{EMPLOYEE})) \cup \pi_{super_ssn}(\sigma_{Dno=5}(\text{EMPLOYEE}))$$

- (c) List the names and numbers of all departments locating in 'Houston'

$$\pi_{Dname,Dnumber}(\sigma_{Dlocation='Houston'}(\text{DEPARTMENT} * \text{DEPT_LOCATIONS}))$$

- (d) List the first names of all employees who have a dependent with the same first name as themselves

$$\pi_{Fname}(\text{EMPLOYEE} \bowtie_{Ssn=Essn \text{ AND } Fname=Depende_name} \text{DEPENDENT}))$$

- (e) Retrieve the salary of all employees in department 5 who work more than 10 hours per week on the project named 'ProjectX'

$$\text{WORK_PROJ} \leftarrow \text{WORKS_ON} \bowtie_{Pnumber=Pno} \text{PROJECT}$$

$$\text{PROJECTX10} \leftarrow \sigma_{Pname='ProjectX' \text{ AND } \text{Hours}>10}(\text{WORK_PROJ})$$

$$\pi_{Salary}(\text{PROJECTX10} \bowtie_{Essn=Ssn \text{ AND } Dno=5} \text{EMPLOYEE})$$