Part 1 – Joins

$T1 \bowtie_{T1.A=T2.A} T2$

T1.A	Q	R	T2.A	B	C
20	a	5	20	b	6
20	a	5	20	b	5

$T1 \bowtie_{T1.Q=T2.B} T2$

T1.A	Q	R	T2.A	B	C
25	b	8	20	b	6
25	b	8	20	b	5

$T1 \bowtie T2$

A	Q	R	B	C
20	a	5	b	6
20	a	5	b	5

$T1 \bowtie_{T1.A=T2.A \wedge T1.R=T2.C} T2$

T1.A	Q	R	T2.A	B	C
20	a	5	20	b	5

Part 2 – Chess Queries

1) $\pi_{Name}(\sigma_{Elo \geq 2850}{}^{(Players)})$
2) $\pi_{Name}(Players \bowtie_{Players.pID=Games.wpID} Games)$
3) $\pi_{Name}(\sigma_{Result="1-0"}{}^{(Players \bowtie_{Players.pID=Games.wpID} Games)})$
4) $\rho(games2018, \pi_{wpID,bpID}(\sigma_{Year=2018}{}^{(Games \bowtie Events)}))$

   $\rho(whitePlayers, \pi_{wpID}(games2018 \bowtie_{games2018.wpID=players.pID} Players)$

   $\rho(blackPlayers, \pi_{bpID}(games2018 \bowtie_{games2018.bpID=players.pID} Players)$

   $whitePlayers \cup blackPlayers$

5) $\rho(wpPlayers, \rho(wpName, wpID)\left(\pi_{Name,pID}(Players)\right))$

$$\rho(bpPlayers, \rho(bpName, bpID)\left(\pi_{Name,pID}(Players)\right))$$

$$\rho(allGames, \left(((Games \bowtie Events) \bowtie wpPlayers) \bowtie bpPlayers\right))$$

$$\pi_{Name,Year}(\sigma_{(wpName=\text{Magnus Carlsen} \wedge Result=\text{0-1}) \vee (bpName=\text{Magnus Carlsen} \wedge Result=\text{1-0})}{}^{(allGames)})$$

6) $$\rho(whitePlayers, \pi_{wpID,Name}\left(\rho(magnusBp, \sigma_{bpID=1}(games)) \bowtie_{magnusBp.wpID=players.pID} Players\right)$$
$$\rho(blackPlayers, \pi_{bpID,Name}\left(\rho(magnusWp, \sigma_{wpID=1}(games)) \bowtie_{magnusWp.bpID=players.pID} Players\right)$$

$$\rho(playerID, Name)(whitePlayers) \cup \rho(playerID, Name)(blackPlayers)$$

Part 3.1

a)

Name
Hermione
Harry

b) The name of students that do not have a C

Part 3.2

a)

Name
Hermione

b) Get the name of students who have the same date of birth as Ron

Part 3.3

a)

cName

- this query results in an empty table as there is not course that has all students

b) Which courses have all students enrolled in them?

Part 4

$$\pi_{Name}(((\pi_{sID,cID}(Enrolled))/\pi_{cID}(\sigma_{cID\geq 3000 \wedge cID<4000}(Courses))) \bowtie Students)$$