Jonathan Pilling

Homework 3

Databases

Part 1.

1.

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

2.

A	Q	R	B	C
25	b	8	Null	Null
20	a	5	b	6
20	a	5	b	5

3.

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

4.

A	Q	R	B	C
20	a	5	b	5

Part 2.

1. $\pi_{\text{Names}}(\sigma_{\text{Elo} > 2849}(\text{Players}))$
2. $\pi_{\text{Names}}(\text{Players} \bowtie_{\text{WID} == \text{PID}} \text{Games})$
3. $\rho(\text{wpiWinner}, \pi_{\text{wpid}}(\sigma_{\text{result} == \text{“1-0”}}(\text{Games})))$

   $\pi_{\text{Names}}(\sigma_{\text{wpiWinner} == \text{Pid}}(\text{Players x wpiWinner}))$
4. $\rho(\text{Games2018}, \pi_{\text{eid}}(\sigma_{\text{year} == 2018}(\text{Events})))$

   $\rho(\text{Players2018}, \pi_{\text{wpid,bpid}}(\sigma_{\text{eid} == \text{Games2018}}(\text{Games x Games2018})))$

π_{Names} (σ PID == Players2018.bpid $\vee$Pid == Players2018.wpid (Players x Players2018))

5. ρ(Magnus, π_{pid}(σ_{Name} == "Magnus Carlsen" (Players)))

   ρ(gamesMagLost, π_{eid}(σ(wpid == Magnus $\wedge$ result == "0-1") $\vee$ (bpid == Magnus $\wedge$ result == "1-0") (Games x Magnus))

   $\pi_{Names, Year}$(σ gamesMagLost== eid (Events x gamesMagLost))

6. ρ(Magnus, π_{pid}(σ_{Name} == "Magnus Carlsen" (Players)))

   ρ(blackOpponents, π_{bpid}(σ_{wpid} == Magnus (Games x Magnus))

   ρ(whiteOpponents, π_{wpid}(σ_{bpid} == Magnus (Games x Magnus))

   π_{Names} (σ (pid == blackOpponents) $\vee$ (pid == whiteOpponents)(Players x blackOpponents x whiteOpponents))

Part 3

1. a.

Name
Hermione
Harry

   b. Queries the students who don't have any C's in any of there enrolled classes.

2. a.

Name
Hermione

   b. Queries the students with the same DOB as Ron.

3. a.

Null

   b. Queries for the names of courses with all students enrolled.

4. ρ(3000Classes, π_{cID}($\sigma_{cID > 2999 \wedge cID < 4000}$ (Courses))

π_{Names} ((Enrolled / 3000Classes) $\bowtie$ Students)