Homework 3

Databases

Part 1.

1.

T1.A	Q	R	T2.A	В	С
20	а	5	20	b	6
20	а	5	20	b	5

2.

Α	Q	R	В	С
25	b	8	Null	Null
20	а	5	b	6
20	а	5	b	5

3.

Α	Q	R	В	С
20	a	5	b	6
20	a	5	b	5

4.

Α	Q	R	В	С
20	а	5	b	5

Part 2.

- 1. $\pi_{\text{Names}}(\sigma_{\text{Elo}} > 2849 (\text{Players}))$
- 2. $\pi_{\text{Names}}(\text{Players} \bowtie_{\text{WID} == \text{PID}} Games)$
- 3. $\rho(wpiWinner, \pi_{wpid}(\sigma_{result} == "1-0" (Games)))$ $\pi_{Names}(\sigma_{wpiWinner} == Pid(Players x wpiWinner))$
- 4. $\rho(Games2018, \pi_{eid}(\sigma_{year} == 2018 \text{ (Events)}))$ $\rho(Players2018, \pi_{wpid,bpid}(\sigma_{eid} == Games2018 \text{ (Games x Games2018)}))$

 π_{Names} ($\sigma_{\text{PID}} == \text{Players} = 2018.\text{bpid} \vee \text{Pid} == \text{Players} = 2018.\text{wpid} (\text{Players} \times \text{Players} = 2018)$)

5. $\rho(Magnus, \pi_{pid}(\sigma_{Name} == "Magnus Carlsen" (Players)))$

 $\rho(\mathsf{gamesMagLost}, \pi_{eid}(\sigma(\mathsf{wpid} == \mathsf{Magnus} \land \mathsf{result} == \text{``0-1''}) \lor (\mathsf{bpid} == \mathsf{Magnus} \land \mathsf{result} == \text{``1-0''}) (\mathsf{Games} \times \mathsf{Magnus})))$

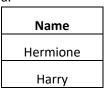
 $\pi_{Names, Year}(\sigma_{gamesMagLost== eid}(Events \ x \ gamesMagLost))$

6. $\rho(Magnus, \pi_{pid}(\sigma_{Name} == "Magnus Carlsen" (Players)))$ $\rho(blackOpponents, \pi_{bpid}(\sigma_{wpid} == Magnus (Games x Magnus)))$ $\rho(whiteOpponents, \pi_{wpid}(\sigma_{bpid} == Magnus (Games x Magnus)))$

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

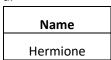
Part 3

1. a.



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

2. a.



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

3. a.



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

4. $\rho(3000\text{Classes}, \pi_{cID}(\sigma_{cID} > 2999 \land cID < 4000 (Courses)))$

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