

Q11

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CS-353 HW1

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a)

$$\pi_{\text{teamname}, \text{city}} \left( \sigma_{\text{game-date} = 20109120} (\text{Game}) \bowtie_{\text{home-id} = \text{team-id}} \text{Team} \right)$$

b)

$$\pi_{\text{team-id}, \text{teamname}} \left( \sigma_{\text{game-date} > 01109120} (\text{Game}) \bowtie_{\text{home-id} = \text{team-id}} \text{Team} \right)$$

$\downarrow$   
 $\text{away-id} = \text{team-id}$

c)

$$\pi_{\text{teamname}, \text{city}} \left( \sigma_{\text{home-score} > \text{away-score}} (\text{Game}) \bowtie_{\text{home-id} = \text{team-id}} \text{Team} \right)$$

d)

$$\pi_{\text{player-id}, \text{player-name}} \left( \sigma_{\text{away-score} > \text{home-score}} (\text{Game}) \bowtie_{\text{away-id} = \text{team-id}} \text{Player} \right)$$

$$e) \text{ winners} \leftarrow \rho \left( \pi_{\text{home-id}} \left( \sigma(\text{Game})_{\text{home-score} > \text{away-score}} \right) \right) \cup \rho \left( \pi_{\text{away-id}} \left( \sigma(\text{Game})_{\text{away-score} > \text{home-score}} \right) \right)$$

$$\text{losers} \leftarrow \pi_{\text{team-id}}(\text{Team}) - \text{winners}$$

$$\pi_{\text{team-name}}(\text{loser ID}, \bowtie \text{Team})$$

$$f) \text{ games} \leftarrow \sigma(\text{Game})_{\substack{\text{game-date} \geq 01/01/2019 \\ \wedge \\ \text{game-date} < 01/01/2020}}$$

$$g) \left( \pi_{(\text{home-score} + \text{away-score}) \text{ as total-score}}(\text{games}) \right)$$

sum (total-score) as all goals



Q2)

$$a) \pi_{r\_name} \left( \sigma_{\text{weight} > 10} (Retailer \bowtie Seller) \bowtie Product \right)$$

$$b) \pi_{r\_name} \left( \sigma_{\text{max\_weight} \leq 10} \left( (r\_id, r\_name) \underset{\text{max (weight or max\_weight)}}{g} ((Retailer \bowtie Seller) \bowtie Product) \right) \right)$$

$$c) t \leftarrow (Retailer \bowtie Seller) \bowtie Product$$

$$\pi_{price} \left( \sigma_{\substack{\text{weight} > 10 \\ \wedge \\ \text{City} = \text{Istanbul}}} (t) \right)$$

$$d) t \leftarrow Seller \bowtie Product$$

$$\pi_{\substack{p\_id \\ \text{avg-price}}} (p\_id \underset{\text{avg-price}}{g} \text{avg-price as avg-price}(t))$$

$$e) t \leftarrow Seller \bowtie Product$$

$$\pi_{p\_id} \underset{\text{Count (price) as total-sell}}{g} \left( \sigma_{\text{price} > 100} (t) \right)$$

f)

$$S \leftarrow \pi_{p-id} \left( \sigma_{\substack{\text{avg-price} > 150 \\ \text{avg-price} \text{ or } \text{avg-price}}} \left( p-id \ G(sell, s) \right) \right)$$

$$S \bowtie \text{product}$$

g)

$$S \leftarrow p-id \ G(sell, s)$$

$$\substack{\text{avg-price} \text{ or } \text{avg-price}}$$

$$k \leftarrow G(s)$$

$$\substack{\text{max}(\text{avg-price}) (s) \\ \text{max}(\text{avg-price}) \text{ or } \text{avg-price}}$$

$$\pi_{p-id} (S \bowtie k)$$

h)

$$t \leftarrow (\text{Retailer} \bowtie \text{sell}) \bowtie \sigma_{\text{product}} (p-name = "New Prod")$$

$$S \leftarrow G_{\text{max-price} \text{ or } \text{price}} (t)$$

$$\pi_{p-id} (S \bowtie t)$$