



Bilkent University
Fall 2023-2024

Department of Computer Engineering

CS353

Database Systems

Homework #1

Deniz Tuna Onguner
22001788

Section 2
Özgür Ulusoy

29 September 2023

Question 1

I've typed the following expressions via LaTeX

- (a) $\Pi_{m-id, title}(\sigma_{year=2022 \wedge dCountry='Turkey'}(Movie \bowtie Director))$
- (b) $\Pi_{s-id, name}(\sigma_{dName='Alfred Hitchcock' \wedge year \geq 1960 \wedge year \leq 1969}(Movie \bowtie StarIn \bowtie MovieStar))$
- (c) $\Pi_{name, birthYear, sCountry} \left(\sigma_{birthYear < 1983} \left(\left(\sigma_{year=2022 \wedge rating > 6.0}(Movie) \right) \bowtie StarIn \bowtie MovieStar \right) \right)$
- (d) $\Pi_{dName}(\sigma_{dCountry='Turkey'}(Movie \bowtie Director - (\sigma_{rating < 6.0}(Movie \bowtie Director))))$
- (e) $\Pi_{name, sCountry}((\sigma_{birthYear > 1998}(MovieStar)) \bowtie StarIn \bowtie (\sigma_{genre='horror' \wedge year=2022}(Movie)) \bowtie (\sigma_{dCountry='USA'}(Director)))$
- (f) $\mathcal{G}_{avg(rating)}(\sigma_{genre='horror' \wedge dName='Alfred Hitchcock'}(Movie \bowtie Director))$
- (g) $year \mathcal{G}_{count(m-id)}(\sigma_{genre='comedy' \wedge rating > 9.0}(Movie))$
- (h) $temp \leftarrow dName \mathcal{G}_{count(m-id) \text{ as tot-movies}} ($
 $(\sigma_{rating > 6.0 \wedge genre='action' \wedge year > 2010}(Movie)) \bowtie Director)$
 $\Pi_{dName}(\sigma_{tot-movies > 3}(temp))$
- (i) $\Pi_{dName}(\mathcal{G}_{max(rating)}((\sigma_{year=2022 \wedge genre='drama'}(Movie)) \bowtie Director))$
- (j) $dCountry, dName \mathcal{G}_{max(rating)}((\sigma_{year=2022 \wedge genre='drama'}(Movie)) \bowtie Director)$
- (k) $\Pi_{dName}(dCountry, year, dName \mathcal{G}_{max(rating)}((\sigma_{genre='drama'}(Movie)) \bowtie Director))$
- (l) $t0 \leftarrow \mathcal{G}_{avg(rating)} ($
 $(\sigma_{dName='Clint Eastwood' \wedge genre='western'}(Movie \bowtie Director)))$
 $t1 \leftarrow (\sigma_{genre='western' \wedge year=2022 \wedge dCountry='USA'}(Movie \bowtie Director))$
 $\Pi_{dName}(\sigma_{rating > t0.rating}(t1))$