

CS 353 Spring 2023

Homework 1

Due: February 28, Tuesday till midnight

You will use the Moodle course page for submission of this assignment

Q.1 [36 pts, 6 pts each] Given the following relational schema about music albums:

Song(s-title, written-by, length)

Singer(s-name, birth-year, nationality)

Album(a-title, s-name, rating, year)

FK: s-name references Singer

SongInAlbum(s-title, a-title, track-number)

FK: s-title references Song

FK: a-title references Album

Give the corresponding **Relational Algebra** queries for each of the following.

- (a) Give the name and nationality of the singers who are younger than 25 and had an album in 2022.
- (b) Give the title and writer of the songs from the albums released in 2022 and have a rating higher than 4.0.
- (c) Give the name of the Turkish singers who do not have an album in 2022.
- (d) Give the title and singer name of the highest rated album of 2022.
- (e) Give the title of the albums from 2022 which have more than 10 songs.
- (f) Give the title and track number of the shortest song in the album entitled “ABC”.

Q.2 [64 pts, 8 pts each] Given the following relational schema for a prescription system:

Doctor(TCK, name, specialty, phone, city)

Patient(TCK, name, phone, birthyear, primary-doctor-TCK)

FK: primary-doctor-TCK references Doctor(TCK)

Drug(name, company, price, production-year)

Prescription(id, date, doctor-TCK, patient-TCK)

FK: doctor-TCK references Doctor(TCK)

FK: patient-TCK references Patient(TCK)

DrugInPrescription(presc-id, drug-name)

FK: presc-id references Prescription(id)

FK: drug-name references Drug(name)

Give the corresponding **Relational Algebra** queries for each of the following.

- (a) Give the name and price of the drugs that Pfizer produced in the last year (i.e., 2022).
- (b) Give the TCK and name of the patients who had a prescription written by their primary doctors yesterday (i.e., 20/02/2023).
- (c) Give the name and company of the drugs which were placed in yesterday’s prescriptions.

- (d)** Give the TCK and name of the patients who are older than 70 and had a prescription yesterday from a doctor in Ankara.
- (e)** For each production year, give the name and company of the drug with the highest price.
- (f)** Give the id of the prescription with the TCK of the doctor who wrote it, which has the highest number of drugs in yesterday's prescriptions.
- (g)** Give the name and company of the drugs which appeared at least 100 times in yesterday's prescriptions.
- (h)** Give the TCK and name of the oldest patients for whom at least 10 prescriptions have been written.