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CS353 sec01

hw1

Q.1 [24 pts, 6 pts each] Given the following relational schema:

course(c-id, cname, department)

instructor(i-id, iname)

teaches(i-id, c-id, semester)

A)

Project instructor names who teach cs102 in Spring 2022

B)

Project instructor names who don't teach cs courses in Spring 2022

C)

Instructor who teaches cs courses in Spring22 are grouped by c-id.

D)

Project the course name of the cs department's most given course in Spring 22

Q.2 [76 pts. First 2 parts 5 pts each, the rest 6 pts each]

Given the following relational schema:

Movie (Title, Year, Rating)

Actor (SSN, Name, Byear, Phone)

Acts (SSN, Title, Role)

Theater (TName, City)

Schedule (TName, Title, Date, Time, TicketPrice)

(a) Find the movies (Titles) shown in the theaters in Ankara during the last year (i.e., in 2021).

$\Pi_{Title}(\ Movie \bowtie \sigma_{date = \text{“2021”}} Schedule \bowtie \sigma_{City= \text{“Ankara”}} (Theater))$

(b) Find the theaters (Tnames) in Ankara showing the movies of the last year (i.e., 2021).

$\Pi_{TName}(\sigma_{Year = \text{“2021”}}(Movie) \bowtie Schedule \bowtie \sigma_{City= \text{“Ankara”}}(Theater))$

(c) Find the theaters in Ankara showing only the movies of the last year.

$\Pi_{TName}((\sigma_{Year = \text{“2021”}}(Movie) \bowtie Schedule \bowtie \sigma_{City= \text{“Ankara”}}(Theater)) \div \sigma_{City= \text{“Ankara”}}(Theater))$

(d) Find the ticket prices of the movies with a rating higher than 4.0 which are shown in the theaters in Ankara within this month (in February).

$\Pi_{TicketPrice}(\sigma_{Rating > 4,0}(Movie) \bowtie \sigma_{date=\text{”2021”} \wedge time= \text{“February”}}(Schedule) \bowtie \sigma_{City= \text{“Ankara”}}(Theater))$

(e) Find the name and birth year of the actors who have appeared in the movies of the last year which has a rating higher than 2.5.

$\Pi_{Name,Byear}((\sigma_{Year = \text{“2021”} \wedge Rating > 2,5}(Movie) \bowtie Acts) \bowtie Actor)$

(f) Find the names of the actors who are older than 50 and have appeared in the movies which have a rating higher than 3.0 and were shown in the theaters in Ankara during the last year.

$\Pi_{Name}(((\sigma_{Rating > 3,0}(Movie) \bowtie \sigma_{date=\text{”2021”}}(Schedule) \bowtie \sigma_{City= \text{“Ankara”}}(Theater)) \bowtie Acts) \bowtie \sigma_{byear < 1972}(Actor))$

(g) Find the theaters in Ankara showing all the movies of Anthony Hopkins.

$\Pi_{Tname}(\sigma_{City= \text{“Ankara”}}(Theater) \bowtie ((\sigma_{Name= \text{“Anthony Hopkins”}}(Actor) \bowtie Acts) \bowtie Schedule))$

(h) Find the theaters in Ankara not showing the movies of Jodie Foster.

$\Pi_{Tname}(((\sigma_{City= \text{“Ankara”}}(Theater) - \sigma_{City= \text{“Ankara”}}(Theater)) \bowtie (\sigma_{Name= \text{“Jodie Foster”}}(Actor) \bowtie Acts)) \bowtie Schedule)$

(i) Apply a 10% increase in the ticket price of the theaters in Ankara.

Temp1 <---- $\sigma_{City= \text{“Ankara”}}(Theater) \bowtie Schedule$

Res<---- $\Pi_{Tname,Title,Date,Time,(TicketPrice*110)/100,\ city}(Temp1)$

$\Pi_{TicketPrice}(Res)$

(j) Find the movie of the last year with the highest rating. Do not use any aggregate function.

temp<----$\Pi_{r1.rating}(P_{r1}(\sigma_{Year = \text{“2021”}}(Movie)) \bowtie_{\mathbf{r1.rating<r2.rating}} P_{r2}(\sigma_{Year = \text{“2021”}}(Movie)))$

Π_{rating}(movie) - temp

(k) Find the movie of the last year with the highest rating, using aggregate functions.

res<--- $_{Title}G_{max(rating)\ as\ rtg}$ ($\sigma_{Year = "2021"}$(Movie))

Π_{Title} (res)

(l) For each year find the movie with the highest rating.

res<--- $_{Title,Year}G_{max(rating)\ as\ rtg}$ (Movie)

$\Pi_{Title,Year}$ (res)

(m) Find the year in which the highest number of movies were produced.

temp1<--- $_{Year}G_{count(*)\ as\ cnt}$ ((Movie))

res<--- $_{Year}$ $G_{max(cnt)\ as\ cnt}$ (temp1)

Π_{Year} (res)