6-12-2017

Set Operations

1. Union
    - R ∪ S
2. Intersection
    - R ∩ S
3. Set Difference
    - R - S

Relational Operators

1. Project (Select)
    - $\pi_{Altrlist}$ (R)
2. Select
    - $\sigma_{predicate}$ (R)
3. Cartesian Product
    - R X S
4. Natural Join
    - R ⋈ S
5. Theta Join
    - R $\bowtie_{predicate}$ S
6. Rename
    - $\rho_{MyStarsIn(Title,Year,MovieStar)}$ (StarsIn)

Examples 4notes13 part 2

Movie (Title,Year,length,filmType,studioName,producerC#)
StarsIn (MovieTitle,MovieYear,StarName)
MovieStar(Name,address,gender,birthdate)
MovieExec(name,address,Cert#,netWorth)
Studio (Name,address,presC#)

1. Find all movies made by disney
    - $\sigma_{studioname='Disney'}$ (Movies)
2. Find all movies made by disney or MCM
    - $\sigma_{studioname='Disney' or studioname='MCM'}$ (Movies)

3. Find all movie execs that are also movie stars
    - π_{name} (MovieStar) ∩ π_{name} (MovieExec)
    - or
    - MovieStar (MS) ⋈ MovieExec (ME)
        - $MS.name = ME.name$
4. Find the names of all execs who work for a studio of which they were employed as a star
    - MovieExec $\bowtie_{CertNum=PresNum}$ Studio
    - Movie (M) $\bowtie_{Title=MovieTitleANDYear=MovieYear}$ StarsIN (SI)
    - MovieExec $\bowtie_{CertNum=PresNum}$ Studio $\bowtie_{ME.name=StarnameANDStudio.name=Studioname}$ Movie (M) $\bowtie_{Title=MovieTitleANDYear=MovieYear}$ StarsIN (SI)
5. Find all movies that have exactly 1 star
    - ($\pi_{MT,MY}$ (StarsIn)) - ($\pi_{S1.MT,S1.MY}$ (StarsIn (S1) $\bowtie_{S1.title=S2.titleANDS1.year=S2.yearANDS1.starname<S2.starname}$ StarsIn (S2)))
6. Find all movies that have at least 2 stars
7. Find all movies with exactly 2 stars

Examples 4notes14 part 1

Movie (Title,Year,length,filmType,studioName,producerC#)
StarsIn (MovieTitle,MovieYear,StarName)
MovieStar(Name,address,gender,birthdate)
MovieExec(name,address,Cert#,netWorth)
Studio (Name,address,presC#)

1. What are the stars of movies that are at least 100 minutes long?
    - Option 1
        - $\pi_{starname}$ ($\sigma_{length>100}$ (Movies $\bowtie_{Title=MovieTitleANDYear=MovieYear}$ StarsIn))
    - Option 2
        i. Movies $\bowtie_{Title=MovieTitleANDYear=MovieYear}$ StarsIn
        ii. $\sigma_{length>100}$ (1)
        iii. $\pi_{starname}$ (2)
    - Option 3
        i. $\pi_{starname}$
        ii. $\sigma_{length>100}$
        iii. $\bowtie_{Title=MovieTitleANDYear=MovieYear}$
            - Movies
            - StarsIn
2. Find the address of the studio who produced the Star Wars movie made in 1977
    - $\pi_{Address}$
    - $\bowtie_{studioname=name}$
        - $\sigma_{t=stANDy=zy}$
            - movie
        - studio