20000838
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332 Relation Algebra

1) $Birdbox\,ID \leftarrow \Pi_{mov\_id}(\sigma_{mov\_title = Birdbox}(movie))$

$BBact\_ids \leftarrow \Pi_{act\_id}(Birdbox\,ID \bowtie movie\_cast)$

$Result \leftarrow \Pi_{\substack{act\_fname,\\ act\_lname}}(BBact\_ids \bowtie actor)$

2) $Result \leftarrow dir\_id\ \mathcal{F}_{\substack{count(mov\_id)\\ as\ numMovies}}(movie\_direction)$.

3) $MoviesandGenres \leftarrow \Pi_{\substack{mov\_id,\\ mov\_title,\\ gen\_id}}(movie \bowtie movie\_genres)$

$Result \leftarrow \Pi_{\substack{mov\_title,\\ gen\_title}}(MoviesandGenres \bowtie genres)$

4) $ChuckID \leftarrow \Pi_{rev\_id}(\sigma_{rev\_name = "ChuckShmit"}(reviewer))$

$4Stars \leftarrow \Pi_{mov\_id}(\sigma_{rev\_stars = 4}(ChuckID \bowtie rating))$

$Result \leftarrow \Pi_{mov\_title}(4stars \bowtie movie)$

5) $2012 \leftarrow \Pi_{\substack{mov\_id\\ mov\_title}}(\sigma_{mov\_year = 2012}(movie))$

$intermediate \leftarrow (2012 \bowtie movie\_cast) \bowtie movie\_direction$

movid	mov_title	actid	role	dir_id

$intermediate2 \leftarrow mov\_id\ \mathcal{F}_{\substack{count(act\_id)\\ castSize}}(intermediate)$

mov_id	castSize

$intermediate3 \leftarrow \Pi_{\substack{mov\_title,\\ dir\_id,\\ castSize}}(intermediate \bowtie intermediate2)$

mov_title	dir_id	castSize

$Result \leftarrow intermediate3 \bowtie director$

dir_id	dirfname	dir_lname	mov_title	castSize

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6) $EnglishMovies \leftarrow \Pi_{\substack{mov\_id,\\ mov\_title}}(\sigma_{mov\_lang='English'}(movie))$

$EnglishMovieRatings \leftarrow EnglishMovies \bowtie rating$

$Result \leftarrow {}_{mov\_title}\mathcal{F}_{\substack{count(mov\_id)\\ as\ numRatings}}(EnglishMovieRatings)$

7) $moviesAndCastSize \leftarrow {}_{mov\_id}\mathcal{F}_{\substack{count(act\_id)\\ as\ castSize}}(movie\_cast)$

$properSize \leftarrow \Pi_{mov\_id}(\sigma_{\substack{castSize=2\ OR\\ castSize=4}}(moviesAndCastSize))$

$movTitles \leftarrow \Pi_{\substack{mov\_id,\\ mov\_title}}(properSize \bowtie movie)$

$movRatings \leftarrow properSize \bowtie rating$

$avgRatings \leftarrow {}_{mov\_id}\mathcal{F}_{\substack{average(rev\_stars)\\ as\ rating}}(movRatings)$

$Result \leftarrow \Pi_{\substack{mov\_title,\\ rating}}(avgRatings \bowtie movTitles)$

8) $moviesWithSelena \leftarrow \Pi_{mov\_id}((\sigma_{\substack{act\_fname=Selena\\ AND\\ act\_lname=Gomez}}(actor) \bowtie movie\_cast))$

$selenasTitles \leftarrow \Pi_{\substack{mov\_id,\\ mov\_title}}(moviesWithSelena \bowtie movie)$

$selenasDirectors \leftarrow \Pi_{\substack{dir\_fname,\\ dir\_lname,\\ mov\_title}}((selenasTitles \bowtie movie\_direction) \bowtie director)$

$Result \leftarrow \Pi_{mov\_title}(\sigma_{\substack{dir\_fname!='Woody'\\ AND\\ dir\_lname!='Allen'}}(selenasDirectors))$

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9) $ThrillerID \leftarrow \Pi_{gen\_id}(\sigma_{gen\_title = Thriller}(genres))$

$ThrillerMovieIDs \leftarrow \Pi_{mov\_id}(ThrillerID \bowtie movie\_genres)$

$ThrillerRatings \leftarrow ThrillerMovieIDs \bowtie rating$

$avgRating \leftarrow mov\_id\ \mathcal{F}_{average(rev\_stars)\ as\ rating}(ThrillerRating)$

$ThrillerActors \leftarrow movie\_cast \bowtie ThrillerMovieIDs$

$numActors \leftarrow mov\_id\ \mathcal{F}_{count(act\_id)\ as\ castsize}(ThrillerActors)$

$Result \leftarrow \Pi_{mov\_title,\ rating,\ castsize}(movie \bowtie (numActors \bowtie avgRating))$

10) $numReview \leftarrow mov\_id\ \mathcal{F}_{count(mov\_id)\ as\ numRatings}(rating)$

$maxRatings \leftarrow \mathcal{F}_{max(numRatings)\ as\ numRatings}(numReview)$

$maxRatingWithID \leftarrow maxRating \bowtie numReview$

$Result \leftarrow \Pi_{mov\_id,\ numRatings}(movie \bowtie maxRatingWithID)$