

# Relational Algebra Assignment

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## 1 Relations

Actor(id, fname, lname, gender)  
director(id, fname, lname)  
movie(id, title, year, time, lang, dt rel, rel country)  
reviewer(id, name)  
genres(id, title)  
movie direction(id, mov id)  
movie cast(id, mov id, role)  
movie genres(mov id, gen id)  
rating(mov id, rev id, rev starts, num of ratings)

## 2 Queries

1.  $movid \leftarrow \Pi_{mov\_id}(\sigma_{mov\_title="A\ Man\ Called\ Otto"}(movie))$   
 $actid \leftarrow (movid \bowtie movie\_cast)$   
 $result \leftarrow \Pi_{act\_fname,act\_lname}(actid \bowtie actor)$
2.  $directed \leftarrow_{dir\_id} \mathcal{F}_{count(mov\_id) \text{ as } count} (movie\_direction)$   
 $result \leftarrow \sigma_{count>0}(directed)$
3.  $movies \leftarrow \Pi_{mov\_id,mov\_title}(movie)$   
 $genids \leftarrow (movies \bowtie movie\_genres)$   
 $result \leftarrow \Pi_{gen\_title,mov\_title}(genids \bowtie genres)$
4.  $reviews \leftarrow \Pi_{rev\_id}(\sigma_{rev\_name="Dwight\ Schrute"}(reviewer))$   
 $starreviews \leftarrow \sigma_{rev\_stars=4}(reviews \bowtie rating)$   
 $result \leftarrow \Pi_{mov\_title}(starreviews \bowtie movie)$
5.  $moviesin2016 \leftarrow \Pi_{mov\_id,mov\_title}(\sigma_{mov\_year=2016}(movie))$   
 $moviedirectors \leftarrow \Pi_{mov\_id,mov\_title,dir\_fname,dir\_lname}(moviesin2016 \bowtie movie\_direction \bowtie director)$   
 $actors \leftarrow_{mov\_id} \mathcal{F}_{count(act\_id) \text{ as } count}(moviesin2016 \bowtie act\_id)$   
 $result \leftarrow moviesin2016 \bowtie moviedirectors \bowtie actors$
6.  $englishmovies \leftarrow \Pi_{mov\_id,rev\_id}(\sigma_{mov\_lang="EN"}(movie \bowtie rating))$   
 $reviews \leftarrow_{mov\_id} \mathcal{F}_{count(rev\_id) \text{ as } count}(englishmovies)$   
 $result \leftarrow \Pi_{mov\_id,count}(englishmovies \bowtie reviews)$
7.  $movies \leftarrow (actor \bowtie movie\_cast \bowtie movie)$   
 $moviesw36 \leftarrow \Pi_{mov\_id,mov\_title}(\sigma_{count=3 \text{ or } count=6}(mov\_id \mathcal{F}_{count(act\_id) \text{ as } count}(movies)))$   
 $averagerate \leftarrow_{mov\_id} \mathcal{F}_{avg(rev\_stars) \text{ as } count}(moviesw36 \bowtie rating)$   
 $result \leftarrow moviesw36 \bowtie averagerate$

8.  $selena \leftarrow \Pi_{act\_id}(\sigma_{act\_fname="Selena" \text{ and } act\_lname="Gomez"}(actor))$   
 $selenamovies \leftarrow \Pi_{mov\_id}(selena \bowtie movie\_cast)$   
 $smovietitles \leftarrow \Pi_{mov\_id, mov\_title}(selenamovies \bowtie movie)$   
 $woody \leftarrow \Pi_{dir\_id}(\sigma_{dir\_fname="Woody" \text{ and } dir\_lname="Allen"}(director))$   
 $woodymovies \leftarrow \Pi_{mov\_id}(woody \bowtie movie\_direction)$   
 $wmovietitles \leftarrow \Pi_{mov\_id, mov\_title}(woodymovies \bowtie movie)$   
 $result \leftarrow \Pi_{mov\_title}(smovietitles - wmovietitles)$
9.  $comedy \leftarrow \Pi_{mov\_id}(\sigma_{genre\_title = "Comedy"}(movie\_genres \bowtie genres))$   
 $ratings \leftarrow_{mov\_id} \mathcal{F}_{avg(rev\_stars)} \text{ as } avg(comedy \bowtie rating)$   
 $actors \leftarrow_{mov\_id} \mathcal{F}_{count(act\_id)} \text{ as } count(comedy \bowtie movie\_cast)$   
 $result \leftarrow comedy \bowtie ratings \bowtie actors$
10.  $ratings \leftarrow_{mov\_id} \mathcal{F}_{max(rev\_stars)}(movie \bowtie rating)$   
 $result \leftarrow \Pi_{mov\_title}(ratings \bowtie movies)$