

Q1: Oscar-nominated or Oscar-winning movies liked by a user

Q1 =

```
Τ oscars_year desc, title ( # Sort by oscar year
  σ user_id = 1 ∧ (oscars_year ≠ NULL ∨ winner > 0) # select movies liked by user 1 that are Oscar-related
  ( Users ⚡ UserLikesMovie ⚡ Movies # join users, likes, and movies
))
```

Q2: Top 10 most-liked Oscar movies overall

TOP 10: take first 10 tuples after the Τ sorting (RA has no LIMIT operator)

Q2 =

```
Τ like_count desc, title ( # sort by like_count descending
  γ movie_id, title, oscars_year;
  COUNT(DISTINCT user_id) → like_count (
    σ oscars_year ≠ NULL # keep only Oscar movies
    ( Movies ⚡ UserLikesMovie
)))
```

Q3: Tropes in a user's liked movies

Q3 =

```
T liked_movie_count desc, name (
    Y trope_id, name; COUNT(movie_id) → liked_movie_count ( # count liked movies per trope
        ( σ user_id = 1 (UserLikesMovie) ) # select user_id / user_name
            ▷ MovieTrope ▷ Tropes ))
```

Q4: Tropes with highest total like counts across all users

Q4 =

```
T total_likes desc, name ( # sort tropes by total likes
    Y trope_id, name; COUNT(user_id) → total_likes ( # count total likes
        Tropes ▷ MovieTrope ▷ UserLikesMovie
    ))
```

Q5: Genres appearing most frequently among Oscar-winning movies

Q5 =

```
T win_count desc, name ( # sort genres by win count
    Y genre_id, name; COUNT(*) → win_count ( # group by genre
        σ winner > 0 ( # select Oscar-winning movies
            Genres ▷ MovieGenre ▷ Movies
    )))
```

Q6: Oscar movies per genre ordered by number of likes

Q6 =

```
T genre_id, like_count desc, title (
Y genre_id, name, movie_id, title, oscars_year;
COUNT(user_id) → like_count (
σ oscars_year ≠ NULL (
((Movies ✕ MovieGenre) ✕ Genres) ✕ UserLikesMovie
)))
```

Q7: For each user, liked Oscar-winning vs nominated movies

Q7 =

```
T user_id (
Y user_id, username;
COUNT(DISTINCT win_movie_id) → liked_winning_count,
COUNT(DISTINCT nom_movie_id) → liked_nominated_count (
P_{ win_movie_id :=
CASE WHEN winner > 0 THEN movie_id ELSE NULL END,
nom_movie_id :=
CASE WHEN oscars_year ≠ NULL ∧ winner = 0 THEN movie_id ELSE NULL END } (
(Users ✕ UserLikesMovie) ✕ Movies)))
```

Q8: Average likes per movie for Oscar winners and nominees

Q8 =

```
Y avg(like_count) → avg_likes_winners (
```

```
 $\sigma$  oscars_year ≠ NULL (
     $\forall$  movie_id, title, oscars_year, nominated;
        COUNT(user_id) → like_count (
            Movies  $\bowtie_{\{Movies.movie_id = UserLikesMovie.movie_id\}}$  UserLikesMovie
        )
    )
 $\cup$ 
 $\forall$  avg(like_count) → avg_likes_nominees (
     $\sigma$  oscars_year = NULL  $\wedge$  nominated = true (
         $\forall$  movie_id, title, oscars_year, nominated;
            COUNT(user_id) → like_count (
                Movies  $\bowtie_{\{Movies.movie_id = UserLikesMovie.movie_id\}}$  UserLikesMovie
            )))
))
```