

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

Q1 =

```
τ oscar_year desc, title ( # Sort by oscar year
  σ user_id = 1 ∧ (oscar_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, oscar_year;
  COUNT(DISTINCT user_id) → like_count (
    σ oscar_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
      ⋈ MovieTrove ⋈ 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 ⋈ MovieTrove ⋈ 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 =

```
└ genre_id, like_count desc, title (  
  └ genre_id, name, movie_id, title, oscars_year;  
    COUNT(user_id) → like_count (  
      ⌐ oscars_year ≠ NULL (  
        ((Movies ⋈ MovieGenre) ⋈ Genres) ⋈ UserLikesMovie  
      )))
```

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

Q7 =

```
└ user_id (  
  └ user_id, username;  
    COUNT(DISTINCT win_movie_id) → liked_winning_count,  
    COUNT(DISTINCT nom_movie_id) → liked_nominated_count (  
      ⌐ { 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 =

```
└ avg(like_count) → avg_likes_winners (  
  └ genre_id, name, movie_id, title, oscars_year;  
    COUNT(user_id) → like_count (  
      ⌐ oscars_year ≠ NULL (  
        ((Movies ⋈ MovieGenre) ⋈ Genres) ⋈ UserLikesMovie  
      )))
```

```

σ oscar_year ≠ NULL (
  γ movie_id, title, oscar_year, nominated;
  COUNT(user_id) → like_count (
    Movies ⋈_{Movies.movie_id = UserLikesMovie.movie_id} UserLikesMovie
  )
)
)
U
γ avg(like_count) → avg_likes_nominees (
  σ oscar_year = NULL ∧ nominated = true (
    γ movie_id, title, oscar_year, nominated;
    COUNT(user_id) → like_count (
      Movies ⋈_{Movies.movie_id = UserLikesMovie.movie_id} UserLikesMovie
    )
  )
)

```