

تمرین ۲ درس آزمایشگاه پایگاه داده

تحلیل و پیاده‌سازی پایگاه داده فیلم‌ها

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Import کردن داده‌ها به پایگاه داده

در ابتدا نیاز داریم که DATABASE را ایجاد کنیم و سپس جدول‌های مورد نظرمان را در پایگاه داده جدید بسازیم. پس ابتدا از ترمینال کامند `psql -h localhost -p 3307` را اجرا می‌کنیم که به PostgreSQL متصل شویم. سپس یک دیتابیس جدید ایجاد می‌کنیم.

```
create database db_lab_movies;
```

و همین‌طور که در تصویر زیر می‌بینیم دیتابیس ساخته شد.

```
[amir=# \l]
```

| List of databases | | | | | |
|-------------------------|----------|----------|-------------|-------------|--|
| Name | Owner | Encoding | Collate | Ctype | Access privileges |
| amir | amir | UTF8 | en_US.UTF-8 | en_US.UTF-8 | |
| db_lab_movies | amir | UTF8 | en_US.UTF-8 | en_US.UTF-8 | |
| guilan_uni_food_service | amir | UTF8 | en_US.UTF-8 | en_US.UTF-8 | |
| j2 | amir | UTF8 | en_US.UTF-8 | en_US.UTF-8 | |
| postgres | postgres | UTF8 | en_US.UTF-8 | en_US.UTF-8 | |
| template0 | postgres | UTF8 | en_US.UTF-8 | en_US.UTF-8 | =c/postgres + postgres=CTc/postgres |
| template1 | postgres | UTF8 | en_US.UTF-8 | en_US.UTF-8 | =c/postgres + postgres=CTc/postgres |

```
(7 rows)
```

سپس به دیتابیس db_lab_movies متصل می‌شویم.

```
[amir=# \c db_lab_movies
psql (14.6 (Homebrew), server 14.3)
You are now connected to database "db_lab_movies" as user "amir".
db_lab_movies=#
```

سپس با آرگومان \i فایل دستورات ساخت جداول را اجرا می‌کنیم تا جدول‌های مورد نیازمان ساخته شود.

```
db_lab_movies=# \i /Users/amir/Documents/UniProjects/DBLab-Spring2023/HW2/data/mysql.sql
CREATE TABLE
CREATE TABLE
CREATE TABLE
CREATE TABLE
ALTER TABLE
ALTER TABLE
ALTER TABLE
ALTER TABLE
db_lab_movies=#
```

و می‌توانیم جدول‌های موجود در حال حاضر را در دیتابیس مشاهده کنیم.

```
db_lab_movies=# \dt
List of relations
Schema | Name | Type | Owner
-----+-----+-----+-----
public | films | table | amir
public | people | table | amir
public | reviews | table | amir
public | roles | table | amir
(4 rows)
```

هم اکنون باید داده‌های آماده را به ترتیب وارد جداول کنیم. می‌توانیم با دستور COPY این کار را انجام دهیم

```
COPY table_name [ ( column_name [, ...] ) ]
FROM { 'filename' | STDIN }
[ [ WITH ]
    [ BINARY ]
    [ OIDS ]
    [ DELIMITER [ AS ] 'delimiter' ]
    [ NULL [ AS ] 'null string' ]
    [ CSV [ HEADER ]
        [ QUOTE [ AS ] 'quote' ]
        [ ESCAPE [ AS ] 'escape' ]
        [ FORCE NOT NULL column_name [, ...] ] ] ]
```

در این دستور نیاز داریم فایلی که قرار است داده‌ها را از آن import کنیم را وارد کنیم و DELIMITER را برابر 'E'\t قرار می‌دهیم و رشته‌ای که باید null را شناسایی کنید را برابر \N.

```
COPY films FROM '/Users/amir/Documents/UniProjects/DBLab-Spring2023/HW2/data/films.txt' DELIMITER
E'\t' NULL AS '\N' CSV HEADER;
```

```
db_lab_movies=# COPY films FROM '/Users/amir/Documents/UniProjects/DBLab-Spring2023/HW2/data/films.txt' DELIMITER E'\t' NULL AS '\N' CSV HEADER;
COPY 4967
```

و با دستور select رکورد‌های جدول films را دریافت می‌کنیم که ببینیم به درستی Import شده است.

```
db_lab_movies=# SELECT * from films
db_lab_movies=#
```

| id | title | release_year | country | duration | language | certification | gross | budget |
|----|--------------------------------|--------------|---------|----------|----------|---------------|---------|---------|
| 2 | Over the Hill to the Poorhouse | 1928 | USA | 110 | | | 3880000 | 100000 |
| 3 | The Big Parade | 1925 | USA | 151 | | Not Rated | | 245000 |
| 4 | Metropolis | 1927 | Germany | 145 | German | Not Rated | 26435 | 6000000 |
| 5 | Pandora's Box | 1929 | Germany | 110 | German | Not Rated | 9950 | |
| 6 | The Broadway Melody | 1929 | USA | 100 | English | Passed | 2880000 | 379000 |
| 7 | Hell's Angels | 1930 | USA | 96 | English | Passed | | 3950000 |
| 8 | A Farewell to Arms | 1932 | USA | 79 | English | Unrated | | 800000 |
| 9 | 42nd Street | 1933 | USA | 89 | English | Unrated | 2380000 | 439000 |
| 10 | She Done Him Wrong | 1933 | USA | 66 | English | Approved | | 200000 |
| 11 | It Happened One Night | 1934 | USA | 65 | English | Unrated | | 325000 |

و همین کار را برای بقیه table ها هم تکرار می‌کنیم.

```
db_lab_movies=# COPY people FROM '/Users/amir/Documents/UniProjects/DBLab-Spring2023/HW2/data/people.txt' DELIMITER E'\t' NULL AS '\n' CSV HEADER;
COPY 8396
db_lab_movies=# select * from people;
 id |      name      | birthdate | deathdate
-----+-----+-----+-----
  2 | A. Michael Baldwin | 1963-04-04 |
  3 | A. Raven Cruz    |          |
  4 | A.J. Buckley     | 1978-02-09 |
  5 | A.J. DeLucia     |          |
  6 | A.J. Langer      | 1974-05-22 |
  7 | Aaliyah          | 1979-01-16 | 2001-08-25

db_lab_movies=# COPY reviews FROM '/Users/amir/Documents/UniProjects/DBLab-Spring2023/HW2/data/reviews.txt' DELIMITER E'\t' NULL AS '\n' CSV HEADER;
COPY 4967
db_lab_movies=# select * from reviews;
 id | film_id | num_user | num_critic | imdb_score | num_votes | facebook_likes
-----+-----+-----+-----+-----+-----+-----
  2 |    3405 |      285 |        267 |         6.4 |   149998 |             0
  3 |    478 |       65 |         29 |         3.2 |    8465 |            491
  4 |     74 |       83 |         25 |         7.6 |    7071 |            930
  5 |   1254 |     1437 |        224 |         8   |  241030 |           13000
  6 |    740 |       111 |         64 |         6.4 |   64742 |             0
  7 |   4841 |     1058 |        579 |         8.1 |  479047 |          117000

db_lab_movies=# COPY roles FROM '/Users/amir/Documents/UniProjects/DBLab-Spring2023/HW2/data/roles.txt' DELIMITER E'\t' NULL AS '\n' CSV HEADER;
COPY 19790
db_lab_movies=# select * from roles;
 id | film_id | person_id | role
-----+-----+-----+-----
  2 |     1 |    4843 | actor
  3 |     1 |    5050 | actor
  4 |     1 |    8175 | actor
  5 |     2 |    3000 | director
  6 |     2 |    4019 | actor
  7 |     2 |    5274 | actor
```

تمرین های SQL QUERY

.1

```
db_lab_movies=# select title from films;
          title
-----
Over the Hill to the Poorhouse
The Big Parade
Metropolis
Pandora's Box
The Broadway Melody
Hell's Angels
.
```

2. انجام عمل ریاضی ۱۰ تقسیم بر ۳

```
db_lab_movies=# SELECT (10 / 3);
?column?
-----
          3
(1 row)
```

.3

```
db_lab_movies=# select release_year from films;
 release_year
-----
        1920
        1925
        1927
```

.4

```
db_lab_movies=# select name from people;
               name
```

```
-----
A. Michael Baldwin
A. Raven Cruz
A.J. Buckley
A.J. DeLucia
A.J. Langer
```

.5

```
db_lab_movies=# select title from films;
               title
```

```
-----
Over the Hill to the Poorhouse
The Big Parade
Metropolis
Pandora's Box
The Broadway Melody
Hell's Angels
```

.6

```
db_lab_movies=# select title, release_year from films;
               title | release_year
-----+-----
Over the Hill to the Poorhouse | 1920
The Big Parade | 1925
Metropolis | 1927
Pandora's Box | 1929
The Broadway Melody | 1929
```

.7

```
db_lab_movies=# select title, release_year, country from films;
               title | release_year | country
-----+-----+-----
Over the Hill to the Poorhouse | 1920 | USA
The Big Parade | 1925 | USA
Metropolis | 1927 | Germany
Pandora's Box | 1929 | Germany
The Broadway Melody | 1929 | USA
```

.8

```
db_lab_movies=# SELECT * from films
db_lab_movies=# ;
 id | title | release_year | country | duration | language | certification | gross | budget
-----+-----+-----+-----+-----+-----+-----+-----+-----
 2 | Over the Hill to the Poorhouse | 1920 | USA | 110 | | | 3000000 | 100000
 3 | The Big Parade | 1925 | USA | 151 | | | 245000 | 245000
 4 | Metropolis | 1927 | Germany | 145 | German | Not Rated | 26435 | 6000000
 5 | Pandora's Box | 1929 | Germany | 110 | German | Not Rated | 9950 | 370000
 6 | The Broadway Melody | 1929 | USA | 100 | English | Passed | 2800000 | 3950000
 7 | Hell's Angels | 1930 | USA | 96 | English | Passed | | 800000
 8 | A Farewell to Arms | 1932 | USA | 79 | English | Unrated | | 430000
 9 | 42nd Street | 1933 | USA | 89 | English | Unrated | 2300000 | 200000
10 | She Done Him Wrong | 1933 | USA | 66 | English | Approved | | 325000
11 | It Happened One Night | 1934 | USA | 65 | English | Unrated | |
```

.9

```
db_lab_movies=# select distinct country from films;
               country
```

```
-----
Soviet Union
Indonesia
Italy
Cameroon
Czech Republic
```

.10

```
[db_lab_movies=# select certification from films;
certification
-----
```

```
Not Rated
Not Rated
Not Rated
Passed
Passed
```

.11

```
[db_lab_movies=# select distinct role from roles;
role
-----
```

```
director
actor
(2 rows)
```

.12

```
[db_lab_movies=# select count(*) from people;
count
-----
```

```
8396
(1 row)
```

.13

```
[db_lab_movies=# select count(birthdate) from people where birthdate is not null;
count
-----
```

```
6151
(1 row)
```

.14

```
[db_lab_movies=# select count(distinct birthdate) from people;
count
-----
```

```
5397
(1 row)
```

.15

```
[db_lab_movies=# select count(distinct country) from films;
count
-----
```

```
64
(1 row)
```

.16

```
db_lab_movies=# select * from films where release_year = 2016;
```

| id | title | release_year | country | duration | language | certification | gross | budget |
|------|---------------------------------|--------------|---------|----------|----------|---------------|----------|-----------|
| 4821 | 10 Cloverfield Lane | 2016 | USA | 104 | English | PG-13 | 71897215 | 15000000 |
| 4822 | 13 Hours | 2016 | USA | 144 | English | R | 52822418 | 50000000 |
| 4823 | A Beginner's Guide to Snuff | 2016 | USA | 87 | English | | | |
| 4824 | Airlift | 2016 | India | 130 | Hindi | | | 4400000 |
| 4825 | Alice Through the Looking Glass | 2016 | USA | 113 | English | PG | 76846624 | 170000000 |
| 4826 | Allegiant | 2016 | USA | 120 | English | PG-13 | 66002193 | 110000000 |
| 4827 | Alleluia! The Devil's Carnival | 2016 | USA | 97 | English | | | 500000 |

.17

```
db_lab_movies=# select count(*) from films where release_year < 2000;
count
-----
1336
(1 row)
```

.18

```
db_lab_movies=# select title, release_year from films where release_year > 2000;
```

| title | release_year |
|------------------------------|--------------|
| 15 Minutes | 2001 |
| 3000 Miles to Graceland | 2001 |
| A Beautiful Mind | 2001 |
| A Knight's Tale | 2001 |
| A.I. Artificial Intelligence | 2001 |
| Ali | 2001 |
| Alias Betty | 2001 |
| All the Queen's Men | 2001 |
| Along Came a Spider | 2001 |

.19

```
db_lab_movies=# select * from films where language = 'French';
```

| id | title | release_year | country | duration | language | certification | gross | budget |
|------|--------------------------------|--------------|---------|----------|----------|---------------|---------|----------|
| 108 | Une Femme Mariée | 1964 | France | 94 | French | | | 120000 |
| 111 | Pierrot le Fou | 1965 | France | 110 | French | Not Rated | | 300000 |
| 140 | Mississippi Mermaid | 1969 | France | 123 | French | R | 26893 | 1600000 |
| 423 | Subway | 1985 | France | 98 | French | R | | 17000000 |
| 662 | Les visiteurs | 1993 | France | 107 | French | R | 700000 | 50000000 |
| 801 | The Horseman on the Roof | 1995 | France | 135 | French | R | 1877179 | |
| 916 | When the Cat's Away | 1996 | France | 91 | French | R | 1652472 | 300000 |
| 1004 | The Chambermaid on the Titanic | 1997 | France | 101 | French | | 244465 | |

.20

```
db_lab_movies=# select * from people where birthdate='1974-11-11';
id | name | birthdate | deathdate
---+-----+-----+-----
4792 | Leonardo DiCaprio | 1974-11-11 |
(1 row)
```

.21

```
db_lab_movies=# select count(*) from films where language='Hindi';
count
-----
28
(1 row)
```

.22

```
db_lab_movies=# select * from films where certification='R';
```

| id | title | release_year | country | duration | language | certification | gross | budget |
|-----|---------------------------|--------------|---------|----------|----------|---------------|----------|----------|
| 76 | Psycho | 1968 | USA | 108 | English | R | 32888000 | 806947 |
| 99 | A Fistful of Dollars | 1964 | Italy | 99 | Italian | R | 3588800 | 288800 |
| 134 | Rosemary's Baby | 1968 | USA | 136 | English | R | | 2388800 |
| 140 | Mississippi Mermaid | 1969 | France | 123 | French | R | 26893 | 1688800 |
| 145 | The Wild Bunch | 1969 | USA | 144 | English | R | | 6244887 |
| 149 | Catch-22 | 1978 | USA | 122 | English | R | | 18888800 |
| 150 | Cotton Comes to Harlem | 1970 | USA | 97 | English | R | | 1288800 |
| 153 | The Ballad of Cable Hogue | 1978 | USA | 121 | English | R | | 3716946 |

.23

```
db_lab_movies=# select title, release_year from films where release_year < 2000 and language='Spanish';
```

| title | release_year |
|-------------------|--------------|
| El Mariachi | 1992 |
| La otra conquista | 1998 |
| Tango | 1998 |

(3 rows)

.24

```
db_lab_movies=# select title, release_year from films where release_year < 2000 and release_year >= 1990;
```

| title | release_year |
|-----------------------------|--------------|
| Arachnophobia | 1990 |
| Back to the Future Part III | 1990 |
| Child's Play 2 | 1990 |
| Dances with Wolves | 1990 |
| Days of Thunder | 1990 |
| Dick Tracy | 1990 |
| Die Hard 2 | 1990 |
| Edward Scissorhands | 1990 |

.25

```
db_lab_movies=# select title, release_year from films where release_year < 2000 and release_year >= 1990;
```

| title | release_year |
|-----------------------------|--------------|
| Arachnophobia | 1990 |
| Back to the Future Part III | 1990 |
| Child's Play 2 | 1990 |
| Dances with Wolves | 1990 |
| Days of Thunder | 1990 |
| Dick Tracy | 1990 |
| Die Hard 2 | 1990 |
| Edward Scissorhands | 1990 |

.26

```
db_lab_movies=# select title, release_year from films where (release_year = 2000 or release_year = 1990) and duration >= 120;
```

| title | release_year |
|-------------------------|--------------|
| Dances with Wolves | 1990 |
| Die Hard 2 | 1990 |
| Ghost | 1990 |
| Goodfellas | 1990 |
| Mo' Better Blues | 1990 |
| Pretty Woman | 1990 |
| The Godfather: Part III | 1990 |

.27

```
[db_lab_movies=# select name from people where deathdate is null;
      name
```

```
-----
A. Michael Baldwin
A. Raven Cruz
A.J. Buckley
A.J. DeLucia
A.J. Langer
Aaron Ashmore
Aaron Hann
Aaron Hill
```

.28

```
[db_lab_movies=# select count(*) from films where language is null;
      count
```

```
-----
      10
(1 row)
```

.29

```
[db_lab_movies=# select * from people where name like 'B%';
```

| id | name | birthdate | deathdate |
|-----|------------------------------|------------|-----------|
| 634 | B.J. Novak | 1979-07-31 | |
| 635 | Babak Najafi | 1975-09-14 | |
| 636 | Babar Ahmed | | |
| 637 | Bahare Seddiqi | | |
| 638 | Bai Ling | | |
| 639 | Bailee Madison | 1999-10-15 | |
| 640 | Balinese Tari Legong Dancers | | |

.30

```
[db_lab_movies=# select * from people where name like '_r%';
```

| id | name | birthdate | deathdate |
|-----|-------------------|------------|-----------|
| 545 | Ara Celi | 1967-06-19 | |
| 546 | Aramis Knight | 1999-10-03 | |
| 547 | Arben Bajraktaraj | | |
| 548 | Arcelia Ramírez | 1967-12-07 | |
| 549 | Archie Kao | 1969-12-14 | |
| 550 | Archie Panjabi | 1972-05-31 | |

.31

```
[db_lab_movies=# select sum(duration) from films;
      sum
```

```
-----
    534759
(1 row)
```

.32


```
[db_lab_movies=# select max(duration) from films;
      max
-----
      334
(1 row)
```

.33

```
[db_lab_movies=# select avg(duration) from films;
      avg
-----
107.9448930157448526
(1 row)
```

.34

```
[db_lab_movies=# select avg(gross) from films;
      avg
-----
48705108.257335257335
(1 row)
```

.35

```
[db_lab_movies=# select sum(gross) from films where release_year >= 2000;
      sum
-----
150900926358
(1 row)
```

.36

```
[db_lab_movies=# select avg(gross) from films where title like 'A%';
      avg
-----
47893236.422480620155
(1 row)
```

.37

```
[db_lab_movies=# select gross from films where gross is not null and release_year=1994 order by gross asc limit 1;
      gross
-----
      125169
(1 row)
```

.38

```
[db_lab_movies=# select gross from films where gross is not null and release_year > 2000 and release_year <= 2012 order by gross]
desc limit 1;
      gross
-----
      760505847
(1 row)
```

.39

```
[db_lab_movies=# select count(*) * 100.0/ (select count(*) from people) as dead_percentage from people where deathdate is not null;
dead_percentage
-----
9.3735111958075274
(1 row)
```

.40

```
[db_lab_movies=# select count(distinct release_year/10) from films;
count
-----
10
(1 row)
```

.41

```
[db_lab_movies=# select * from films where certification != 'R';
id | title | release_year | country | duration | language | certification | gross | budget
-----
3 | The Big Parade | 1925 | USA | 151 | German | Not Rated | 26435 | 245000
4 | Metropolis | 1927 | Germany | 145 | German | Not Rated | 9950 | 600000
5 | Pandora's Box | 1929 | Germany | 110 | German | Not Rated | 9950 | 379000
6 | The Broadway Melody | 1929 | USA | 100 | English | Passed | 280000 | 395000
7 | Hell's Angels | 1930 | USA | 96 | English | Passed | 9950 | 800000
8 | A Farewell to Arms | 1932 | USA | 79 | English | Unrated | 9950 | 1336755
9 | 42nd Street | 1933 | USA | 80 | English | Unrated | 9950 | 1336755
```

.42

```
[db_lab_movies=# select title, (gross - budget) as net_profit from films;
title | net_profit
-----
Over the Hill to the Poorhouse | 2900000
The Big Parade | -5973565
Metropolis | 2429000
Pandora's Box | 1861000
The Broadway Melody | 2391000
Hell's Angels | -1336755
A Farewell to Arms | 1.8333333333333333
42nd Street | 2.5166666666666667
She Done Him Wrong | 2.4166666666666667
It Happened One Night | 1.8333333333333333
Top Hat | 1.6666666666666667
Modern Times | 1.6000000000000000
```

.43

```
[db_lab_movies=# select title, (duration / 60.0) as duration_hours from films;
title | duration_hours
-----
Over the Hill to the Poorhouse | 2.5166666666666667
The Big Parade | 2.4166666666666667
Metropolis | 1.8333333333333333
Pandora's Box | 1.6666666666666667
The Broadway Melody | 1.6000000000000000
Hell's Angels | 1.3166666666666667
A Farewell to Arms | 1.4833333333333333
42nd Street | 1.1000000000000000
She Done Him Wrong | 1.0000000000000000
It Happened One Night | 1.0000000000000000
```

.44

```
[db_lab_movies=# select avg(duration)/60.0 as avg_duration_hours from films;
avg_duration_hours
-----
1.7990815502624142
(1 row)
```

.45

```
[db_lab_movies=# select name from people order by name asc;
                        name
```

```
-----
A. Michael Baldwin
A. Raven Cruz
A.J. Buckley
A.J. DeLucia
A.J. Langer
AJ Michalka
Aaliyah
```

.46

```
[db_lab_movies=#
select name from people order by birthdate asc;
                        name
```

```
-----
Robert Shaw
Lucille La Verne
Mary Carr
D.W. Griffith
Finlay Currie
Lionel Barrymore
Billy Gilbert
Cecil B. DeMille
```

.47

```
[db_lab_movies=# select name, birthdate from people where birthdate is not null order by birthdate asc;
                        name                | birthdate
```

```
-----+-----
Robert Shaw                | 1837-10-10
Lucille La Verne           | 1872-11-07
Mary Carr                  | 1874-03-14
D.W. Griffith              | 1875-01-22
Finlay Currie              | 1878-01-20
Lionel Barrymore           | 1878-04-28
Billy Gilbert              | 1880-03-21
Cecil B. DeMille           | 1881-08-12
```

.48

```
[db_lab_movies=# select title from films where release_year = 2012 or release_year = 2000 order by release_year desc;
                        title
```

```
-----
Zero Dark Thirty
Dysfunctional Friends
Eddie: The Sleepwalking Cannibal
End of Watch
Ernest & Celestine
Filly Brown
Flight
Foodfight!
For a Good Time, Call...
For Greater Glory: The True Story of Cristiada
Frances Ha
Frankenweenie
```

.49

```
db_lab_movies=# select * from films where release_year=2015 order by duration;
```

| id | title | release_year | country | duration | language | certification | gross | budget |
|------|-----------------------------|--------------|---------|----------|----------|---------------|----------|----------|
| 4611 | Antarctic Edge: 70° South | 2015 | USA | 72 | English | | 4914 | 150000 |
| 4639 | Containment | 2015 | UK | 77 | English | | | |
| 4723 | Queen Crab | 2015 | USA | 80 | English | | | 75000 |
| 4637 | Close Range | 2015 | USA | 80 | English | | | 3000000 |
| 4765 | The Gallows | 2015 | USA | 81 | English | R | 22757819 | 100000 |
| 4802 | To Be Frank, Sinatra at 100 | 2015 | UK | 81 | English | | | 2000000 |
| 4657 | Evolution | 2015 | France | 81 | French | | | |
| 4791 | The Timber | 2015 | USA | 81 | English | | | 2100000 |
| 4614 | AWOL-72 | 2015 | USA | 82 | English | R | | 3000000 |
| 4650 | Diamond Ruff | 2015 | USA | 82 | English | R | | 500000 |
| 4776 | The Latent Effort | 2015 | USA | 82 | English | PG-13 | 25700012 | 22000000 |

.50

```
db_lab_movies=# select title, gross from films where title like 'M%' order by title asc;
```

| title | gross |
|-----------------------------|-----------|
| MacGruber | 8460995 |
| Machete | 26589953 |
| Machete Kills | 7268659 |
| Machine Gun McCain | |
| Machine Gun Preacher | 537580 |
| Mad City | 10556196 |
| Mad Hot Ballroom | 8044906 |
| Mad Max | |
| Mad Max 2: The Road Warrior | 9003011 |
| Mad Max Beyond Thunderdome | 36200000 |
| Mad Max: Fury Road | 153629485 |
| Mad Money | 20668843 |

.51

```
db_lab_movies=# select film_id, imdb_score from reviews order by imdb_score desc;
```

| film_id | imdb_score |
|---------|------------|
| 4960 | 9.5 |
| 742 | 9.3 |
| 178 | 9.2 |
| 4866 | 9.1 |
| 192 | 9 |
| 3110 | 9 |
| 723 | 8.9 |
| 120 | 8.9 |
| 40 | 8.0 |

.52

```
db_lab_movies=# select title, duration from films order by duration desc;
```

| title | duration |
|---|----------|
| Karachi se Lahore | |
| Black Water Transit | |
| Barfi | |
| Hum To Mohabbat Karega | |
| Harry Potter and the Deathly Hallows: Part I | |
| Should've Been Romeo | |
| Destiny | |
| Romantic Schemer | |
| Harry Potter and the Deathly Hallows: Part II | |
| Dil Jo Bhi Kahey... | |
| N-Secure | |
| Wolf Creek | |
| The Naked Ape | |
| Carlos | 334 |
| Blood In, Blood Out | 330 |
| Heaven's Gate | 325 |
| The Legend of Suriyothai | 300 |
| Das Boot | 293 |
| Apocalypse Now | 289 |
| The Company | 286 |
| Gods and Generals | 280 |
| Gettysburg | 271 |
| Arn: The Knight Templar | 270 |
| Once Upon a Time in America | 251 |
| Cleopatra | 251 |
| Emma | 240 |
| The Wolf of Wall Street | 240 |

.53

```
db_lab_movies=# select birthdate, name from people order by name asc, birthdate;
```

| birthdate | name |
|------------|--------------------|
| 1963-04-04 | A. Michael Baldwin |
| | A. Raven Cruz |
| 1978-02-09 | A.J. Buckley |
| | A.J. DeLucia |
| 1974-05-22 | A.J. Langer |
| 1991-04-10 | AJ Michalka |
| 1979-01-16 | Aaliyah |
| 1979-10-07 | Aaron Ashmore |
| | Aaron Hann |
| 1983-04-23 | Aaron Hill |
| | Aaron Hughes |
| 1965-10-26 | Aaron Kwok |

.54

```
db_lab_movies=# select certification, release_year, title from films order by certification asc, release_year;
```

| certification | release_year | title |
|---------------|--------------|---------------------------------|
| Approved | 1933 | She Done Him Wrong |
| Approved | 1935 | Top Hat |
| Approved | 1936 | The Charge of the Light Brigade |
| Approved | 1937 | Snow White and the Seven Dwarfs |
| Approved | 1937 | The Prisoner of Zenda |
| Approved | 1938 | You Can't Take It with You |
| Approved | 1938 | Alexander's Ragtime Band |
| Approved | 1940 | Pinocchio |
| Approved | 1940 | The Blue Bird |
| Approved | 1941 | How Green Was My Valley |
| Approved | 1942 | Bambi |

.55

```
db_lab_movies=# select count(id), release_year from films group by release_year;
```

| count | release_year |
|-------|--------------|
| 5 | 1954 |
| 31 | 1988 |
| 3 | 1959 |
| 10 | 1964 |
| 10 | 1969 |
| 42 | |
| 225 | 2008 |
| 31 | 1991 |
| 33 | 1989 |
| 4 | 1945 |

| | |
|-----|------|
| 5 | 1954 |
| 31 | 1988 |
| 3 | 1959 |
| 10 | 1964 |
| 10 | 1969 |
| 42 | |
| 225 | 2008 |
| 31 | 1991 |
| 33 | 1989 |
| 4 | 1945 |

.56

```
db_lab_movies=# select release_year, avg(duration) from films group by release_year;
```

| release_year | avg |
|--------------|------------------------------------|
| 1954 | 140.600000000000000000000000000000 |
| 1988 | 107.000000000000000000000000000000 |
| 1959 | 136.66666666666666666666666666667 |
| 1964 | 119.400000000000000000000000000000 |
| 1969 | 126.000000000000000000000000000000 |
| | 77.4390243902439024390243902439024 |
| 2008 | 105.38222222222222222222222222222 |
| 1991 | 113.06451612903225811111111111111 |
| 1989 | 113.12121212121212121212121212121 |
| 1945 | 103.750000000000000000000000000000 |

| | |
|------|------------------------------------|
| 1954 | 140.600000000000000000000000000000 |
| 1988 | 107.000000000000000000000000000000 |
| 1959 | 136.66666666666666666666666666667 |
| 1964 | 119.400000000000000000000000000000 |
| 1969 | 126.000000000000000000000000000000 |
| | 77.4390243902439024390243902439024 |
| 2008 | 105.38222222222222222222222222222 |
| 1991 | 113.06451612903225811111111111111 |
| 1989 | 113.12121212121212121212121212121 |
| 1945 | 103.750000000000000000000000000000 |

.57

```
db_lab_movies=# select max(budget), release_year from films group by release_year;
```

| max | release_year |
|-----------|--------------|
| 5000000 | 1954 |
| 110000000 | 1988 |
| 5000000 | 1959 |
| 19000000 | 1964 |
| 20000000 | 1969 |
| 15000000 | |
| 553632000 | 2008 |
| 102000000 | 1991 |
| 69500000 | 1989 |
| 2160000 | 1945 |
| 13000000 | 1974 |
| 26000000 | 1977 |

| | |
|-----------|------|
| 5000000 | 1954 |
| 110000000 | 1988 |
| 5000000 | 1959 |
| 19000000 | 1964 |
| 20000000 | 1969 |
| 15000000 | |
| 553632000 | 2008 |
| 102000000 | 1991 |
| 69500000 | 1989 |
| 2160000 | 1945 |
| 13000000 | 1974 |
| 26000000 | 1977 |

.58

```
[db_lab_movies=# select language, sum(gross) from films group by language;
```

| language | sum |
|----------|-----------|
| Danish | 2403857 |
| Greek | 110197 |
| Dzongkha | 505295 |
| None | 2601847 |
| | 4319281 |
| Tamil | |
| Swahili | |
| Mandarin | 163611530 |
| Urdu | |
| Filipino | 10166502 |
| Bosnian | 301305 |
| Maya | 50859889 |

.59

```
[db_lab_movies=# select release_year, country, max(budget) from films group by release_year, country order by release_year asc, ]
country;
```

| release_year | country | max |
|--------------|---------|---------|
| 1920 | USA | 100000 |
| 1925 | USA | 245000 |
| 1927 | Germany | 6000000 |
| 1929 | Germany | |
| 1929 | USA | 379000 |
| 1930 | USA | 3950000 |
| 1932 | USA | 800000 |
| 1933 | USA | 439000 |
| 1934 | USA | 325000 |
| 1935 | USA | 609000 |
| 1936 | USA | 1500000 |
| 1937 | USA | 2000000 |
| 1938 | USA | 2000000 |
| 1939 | USA | 3977000 |

.60

```
[db_lab_movies=# select count(*) from (select release_year from films group by release_year having count(*) > 200) dt;
count
```

```
-----
13
(1 row)
```

.61

```
[db_lab_movies=# select country, avg(budget) as avg_budget, avg(gross) as avg_gross from films group by country having count(*) ]
> 10 order by country asc limit 5;
```

| country | avg_budget | avg_gross |
|-----------|-----------------------|-----------------------|
| Australia | 31172110.460000000000 | 40205909.571428571429 |
| Canada | 14798458.715596330275 | 22432066.680555555556 |
| China | 62219000.000000000000 | 14143040.736842105263 |
| Denmark | 13922222.222222222222 | 1418469.111111111111 |
| France | 30672034.615384615385 | 16350593.578512396694 |

```
(5 rows)
```