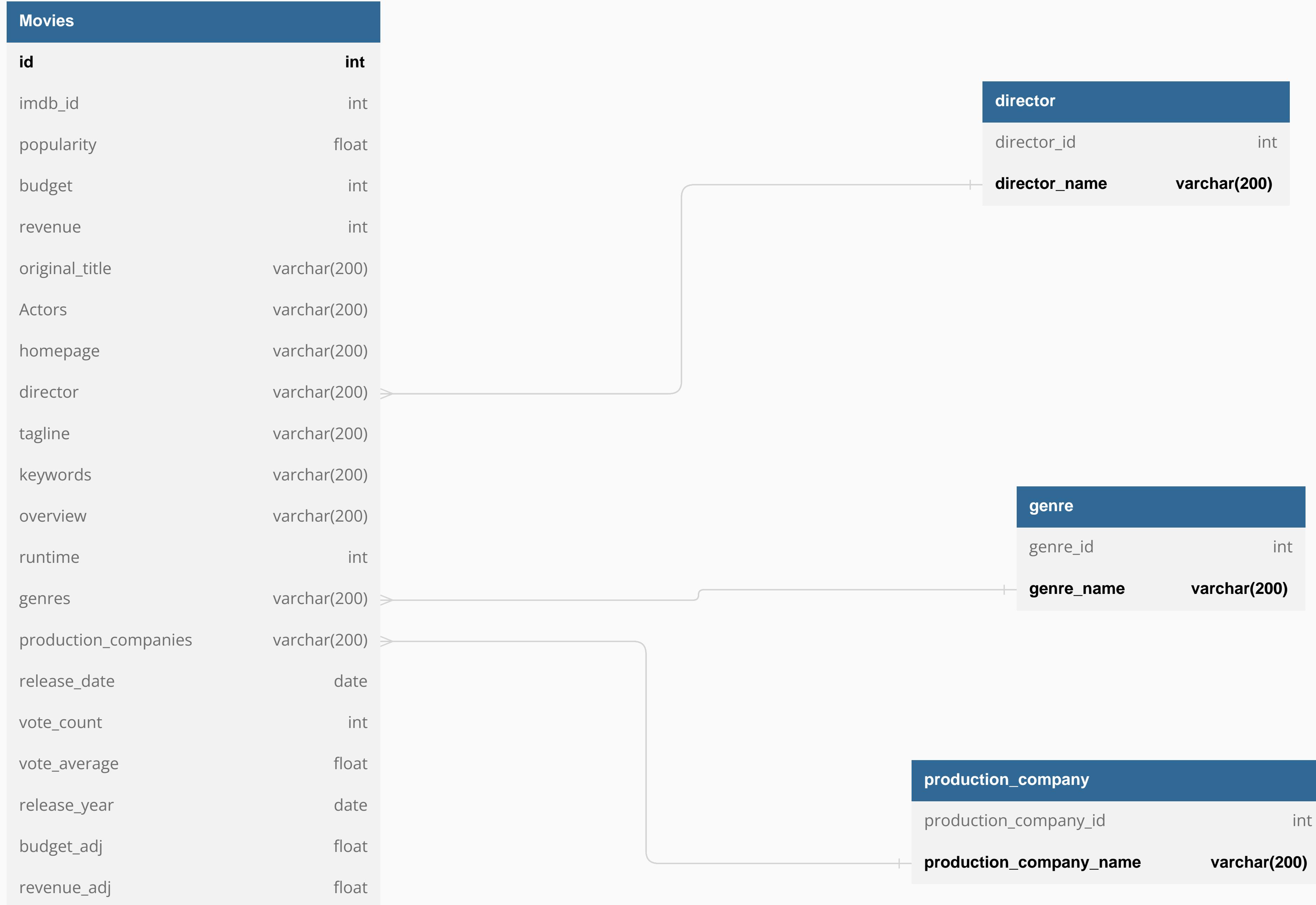


Build a Data Pipeline for Processing and Storing Movies Data

THE SITUATION	<p>Created a data pipeline to process and store sales data from a CSV file. The pipeline will transform and load the data with Python into a PostgreSQL and MySQL database for further analysis using Power BI.</p> <p>Tools required: Python (Pandas), PostgreSQL, MySQL, DBdiagram.io and Power BI</p>
THE STEPS	<p>Used DBdiagram.io:</p> <ul style="list-style-type: none">• To design a dimensional model for TMDB Database. <p>Used MySQL and PostgreSQL to:</p> <ul style="list-style-type: none">• Create a database title TMDB.• Define the database schema under the database (TMDB): genre, director, production_company, Movies. <p>Used Python to:</p> <ul style="list-style-type: none">• Use pandas library to load the movies data from the CSV file into pandas dataframe.• Use pandas to clean and transform the data as needed. For instance, drop some columns, remove duplicates, change date format, create data subset.• Use the psycopg2 and mysql library to connect to the PostgreSQL and MySQL database.• Use pandas, psycopg2, and mysql to load the cleaned and transformed data into the database.• Runed some test queries on the data in the database to ensure the data pipeline is working correctly. <p>Used PowerBI to:</p> <ul style="list-style-type: none">• To connect the raw data• Build a relational data model• Create new calculated columns and DAX measures• Design an interactive report to analyze and visualize the data
THE SUMMARY	<p>After performing data wrangling, data modelling and data visualization. Here, are the following insights from the dataset.</p> <ul style="list-style-type: none">• Total number of movies produced from 1977 to 2015 was 3,701 with the budget of 142,473,661,668 which generate total revenue of 407,278,108,892 and profit of 264,804,447,224 (all the values are in naira)• Paramount Pictures is the top spending production house by 12,752,208,041(naira).• Avatar has the highest profit of 2,544,505,847(naira) which account for 0.94% of the total revenue



SQL SCRIPTS FOR TMDB

```
CREATE TABLE genre (
    genre_id INT,
    genre_name VARCHAR(200) PRIMARY KEY
);

CREATE TABLE director (
    director_id INT,
    director_name VARCHAR(200) PRIMARY KEY
);

CREATE TABLE production_company (
    production_company_id INT,
    production_company_name VARCHAR(200) PRIMARY KEY
);

CREATE TABLE Movies (
    id INT PRIMARY KEY,
    imdb_id INT,
    popularity FLOAT,
    budget INT,
    revenue INT,
    original_title VARCHAR(200),
    Actors VARCHAR(200),
    homepage VARCHAR(200),
    director VARCHAR(200),
    tagline VARCHAR(200),
    keywords VARCHAR(200),
    overview VARCHAR(200),
    runtime INT,
    genres VARCHAR(200),
    production_companies VARCHAR(200),
    release_date DATE,
    vote_count INT,
    vote_average FLOAT,
```

```
release_year DATE,  
budget_adj FLOAT,  
revenue_adj FLOAT,  
FOREIGN KEY (genres)  
    REFERENCES genre (genre_name),  
FOREIGN KEY (production_companies)  
    REFERENCES production_company (production_company_name),  
FOREIGN KEY (director)  
    REFERENCES director (director_name)  
);
```

Read Dataset

```
In [1]: #First, we need to import pandas as a library for data wrangling  
#Then use pd.read_excel function to import the dataset into pandas  
# and save the dataset in a variable called Movies.  
# Therefore, whenever we to read or to modify the dataset, just call the variable "Movies" to make the changes.  
import pandas as pd  
Movies = pd.read_excel(r'C:\Users\Lenovo\Desktop\Personal Documents\DataSet\movies_data.xlsx')
```

```
In [2]: # Read the dataset with the first top 10 rows.  
Movies.head(10)
```

	id	imdb_id	popularity	budget	revenue	original_title	cast	homepage	director	tagline	...	overview	runtime	genres	product
0	135397	t0369610	32.985763	15000000	1513528810	Jurassic World	Chris Pratt Bryce Dallas Howard Irfan Khan Vi...	http://www.jurassicworld.com/	Colin Trevorrow	The park is open. ...	Twenty-two years after the events of Jurassic ...	124	Action Adventure Science Fiction Thriller	Universal Studios	
1	76341	tt1392190	28.419936	150000000	378436354	Mad Max: Fury Road	Tom Hardy Charlize Theron Hugh Keays-Byrne Nic...	http://www.madmaxmovie.com/	George Miller	What a Lovely Day. ...	An apocalyptic story set in the furthest reach...	120	Action Adventure Science Fiction Thriller	V Picture	
2	262500	tt2908446	13.112507	110000000	295238201	Insurgent	Shailene Woodley Theo James Kate Winslet Ansel...	http://www.thedivergentseries.movie//insurgent	Robert Schwentke	One Choice Can Destroy You	Beatrice Prior must confront her inner demons ...	119	Adventure Science Fiction Thriller	Summit Entertainment	
3	140607	tt2488496	11.173104	200000000	2068178225	Star Wars: The Force Awakens	Harrison Ford Mark Hamill Carrie Fisher Adam D...	http://www.starwars.com/films/star-wars-episod...	J.J. Abrams	Every generation has a story. ...	Thirty years after defeating the Galactic Empire...	136	Action Adventure Science Fiction Fantasy	Lucasfilm	
4	168259	tt2820852	9.335014	190000000	1506249360	Furious 7	Vin Diesel Paul Walker Jason Statham Michelle ...	http://www.furious7.com/	James Wan	Vengeance Hits Home ...	Deckard Shaw seeks revenge against Dominic Tor...	137	Action Crime Thriller	Universal Pictures	
5	281957	tt1663202	9.110700	135000000	532950503	The Revenant	Leonardo DiCaprio Tom Hardy Will Poulter Domhn...	http://www.foxmovies.com/movies/the-revenant	Alejandro González Iñárritu	(n. One was returned, as if from the dead.)	In the 1820s, a frontiersman Hugh Glass, sets...	156	Western Drama Adventure Thriller	Entertainment Weekly	
6	87101	tt1340138	8.654359	155000000	440603537	Terminator Genesys	Arnold Schwarzenegger Jason Clarke Emilia Clar...	http://www.terminatormovie.com/	Alan Taylor	Reset the future ...	The year is 2029. John Connor, leader of the resistance...	125	Science Fiction Action Thriller Adventure	Paramount Pictures	
7	286217	tt3659388	7.667400	108000000	595380321	The Martian	Matt Damon Jessica Chastain Kristen Wiig Jeff...	http://www.foxmovies.com/movies/the-martian	Ridley Scott	Bring Him Home ...	During a mission to Mars, Astronaut Matt...	141	Drama Adventure Science Fiction	Twentieth Century Fox Film Corporation	
8	211672	tt2293640	7.404165	74000000	1156730962	Minions	Sandra Bullock Jon Hamm Michael Keaton Allison...	http://www.minionsmovie.com/	Kyle Balda Pierre Coffin	Before Gru, they had a history of bad bosses.	Stuart, Kevin and Bob are recruited by...	91	Family Animation Adventure Comedy	Pictures	
9	150540	tt2096673	6.326804	175000000	853708609	Inside Out	Amy Poehler Phyllis Smith Richard Kind Bill Hader...	http://movies.disney.com/inside-out	Pete Docter	Meet the little voices inside your head. ...	Growing up can be a bumpy road, and it's no ex...	94	Comedy Animation Family	Disney Pictures	

10 rows × 21 columns

```
In [3]: # Data summary which includes data types, number of rows  
Movies.info()
```

```
<class 'pandas.core.frame.DataFrame'>  
RangeIndex: 10866 entries, 0 to 10865  
Data columns (total 21 columns):
```

```
# Column          Non-Null Count  Dtype     
---  
0   id              10866 non-null  int64  
1   imdb_id         10856 non-null  object  
2   popularity      10866 non-null  float64  
3   budget           10866 non-null  int64  
4   revenue          10866 non-null  int64  
5   original_title   10866 non-null  object  
6   cast             10799 non-null  object  
7   homepage         7693 non-null  object  
8   director          44 non-null    object  
9   tagline          8842 non-null  object  
10  keywords         9373 non-null  object  
11  overview         10862 non-null  object  
12  runtime          10866 non-null  int64  
13  genres            10843 non-null  object  
14  production_companies  9836 non-null  object  
15  release_date     10866 non-null  object  
16  vote_count        10866 non-null  int64  
17  vote_average      10866 non-null  float64  
18  release_year      10866 non-null  int64  
19  budget_adj        10866 non-null  float64  
20  revenue_adj       10866 non-null  float64  
dtypes: float64(4), int64(6), object(11)  
memory usage: 1.7+ MB
```

```
In [4]: # From the data summary, we observed that columns like imdb_id, cast, homepage,director,tagline,keywords,overview,genres, and production_companies  
# contain null values because the count rows is less than the total entries.(10866)  
# To verify we will use isna to confirm the total number of null values.  
Movies.isna().sum()
```

	id	imdb_id	popularity	budget	revenue	original_title	cast	homepage	director	tagline	...	overview	runtime	genres	production_companies
0	135397	t0369610	32.985763	15000000	1513528810	Jurassic World	Chris Pratt Bryce Dallas Howard Irfan Khan Vi...	http://www.jurassicworld.com/	Colin Trevorrow	The park is open. ...	Twenty-two years after the events of Jurassic ...	124	Action	Universal Studios	

1	76341	tt1392190	28.419936	15000000	378436354	Mad Max: Fury Road	Tom Hardy Charlize Theron Hugh Keays-Byrne Nic...	http://www.madmaxmovie.com/	George Miller	What a Lovely Day. ...	An apocalyptic story set in the furthest reach...	120	Action	Village Roadshow Pictures
2	262500	tt2908446	13.112507	110000000	295238201	Insurgent	Shailene Woodley Theo James Kate Winslet Ansel...	http://www.thedivergentseries.movie//insurgent	Robert Schwentke	One Choice Can Destroy You	Beatrice Prior must confront her inner demons ...	119	Adventure	Summit Entertainment
3	140607	tt2488496	11.173104	200000000	2068178225	Star Wars: The Force Awakens	Harrison Ford Mark Hamill Carrie Fisher Adam D...	http://www.starwars.com/films/star-wars-episod...	J.J. Abrams	Every generation has a story. ...	Thirty years after defeating the Galactic Empire...	136	Action	Lucasfilm
4	168259	tt2820852	9.335014	190000000	1506249360	Furious 7	Vin Diesel Paul Walker Jason Statham Michelle ...	http://www.furious7.com/	James Wan	Vengeance Hits Home ...	Deckard Shaw seeks revenge against Dominic Tor...	137	Action	Universal Pictures
...

10861	21	tt0060371	0.080598	0	0	The Endless Summer	Michael Hyson Robert August Lord Tally Ho B...	NaN	Bruce Brown	NaN ...	The Endless Summer, by Bruce Brown, is one of...	95	Documentary	Bruce Brown Films
10862	20379	tt0060472	0.065543	0	0	Grand Prix	James Garner Eva Marie Saint Yves Montand Tosh...	NaN	Frankenheimer, John	Cinema sweeps YOU into a drama of speed and ...	Grand Prix driver Pete Iron is fired by his team...	176	Action	Cherokee Productions

10863	39768	tt0060161	0.065141	0	0	Beregis Avtomobilya	Innokenty Smokunovsky Oleg Efremov Georgi Z...	NaN	Eldar Ryazanov	NaN ...	An insurance agent who moonlights as a carthier...	94	Mystery	Mosfilm
10864	21449	tt0061177	0.064317	0	0	What's Up, Tiger Lily?	Takuya Nakabayashi Mieko Hamada Joh...	NaN	Woody Allen	WOODY ALLEN STRIKES BACK! ...	In comic Woody Allen's film debut, he took the...	80	Action	Benedict Pictures Corp.

10865	22293	tt0060666	0.035919	19000	0	Manos: The Hands of Fate	Harold P. Warren Tom Neumann John Reynolds Dian...	NaN	Harold P. Warren	It's Shocking! It's Beyond Your Imagination!	A family gets lost on the road and stumbles up...	74	Horror	Norm-Iris
-------	-------	-----------	----------	-------	---	--------------------------	--	-----	------------------	--	---	----	--------	-----------

10866 rows × 21 columns

```
In [6]: # 1. Change release date format since the data is in a string format.
```

```
Movies['release_date'] = pd.to_datetime(Movies['release_date'])
```

```
Movies['release_date'].head(10)
```

0	2015-09-06
1	2015-05-13
2	2015-03-18
3	2015-12-15
4	2015-04-04
5	2015-12-25
6	2015-06-23
7	2015-09-30
8	2015-06-17
9	2015-09-06

```
Name: release_date, dtype: datetime64[ns]
```

```
In [7]: # 2. Remove duplicates.
```

```
Movies.drop_duplicates(inplace = True)
```

```
Movies.shape
```

```
(10865, 21)
```

```
In [8]: # 3. Remove data value that are zero in budget and revenue column.
```

```
Movies['budget'] = pd.isnull(Movies['budget'])
```

```
Movies['revenue'] = pd.isnull(Movies['revenue'])
```

```
In [9]: Movies.rename({'cast': 'Actors'}, axis = 1, inplace = True)
```

```
Movies['Actors'] = Movies['Actors'].str.replace(' ', '')
```

```
Movies['Actors'] = Movies['Actors'].str.replace('&', ',')
```

```
Movies['Actors'] = Movies['Actors'].str.replace(')', ',')
```



- > Extensions
- > Foreign Data Wrappers
- > Languages
- > Publications
- > Schemas (1)
 - ✓ public
 - > Aggregates
 - > Collations
 - > Domains
 - > FTS Configurations
 - > FTS Dictionaries
 - > FTS Parsers
 - > FTS Templates
 - > Foreign Tables
 - > Functions
 - > Materialized Views
 - > Operators
 - > Procedures
 - > Sequences
 - > Tables (4)
 - > director
 - > genre
 - > movies
 - > production_company
 - > Trigger Functions
 - > Types
 - > Views
 - > Subscriptions
 - > postgres
- > Login/Group Roles
- > Tablespaces

TMDB/postgres@PostgreSQL 15

No limit

Query History

```
1 select * from director;
```

Data Output Messages Notifications

	director	text
1	Colin Trevorrow	
2	Robert Schwentke	
3	Alejandro González Iñárritu	
4	Alan Taylor	
5	Ridley Scott	
6	Kyle Balda Pierre Coffin	
7	Pete Docter	
8	Quentin Tarantino	
9	Kenneth Branagh	
10	Francis Lawrence	

Total rows: 19 of 19 Query complete 00:00:00.248

Ln 1, Col 24





- > Extensions
- > Foreign Data Wrappers
- > Languages
- > Publications
- > Schemas (1)
 - ✓ public
 - > Aggregates
 - > Collations
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 - > FTS Configurations
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 - > Trigger Functions
 - > Types
 - > Views
 - > Subscriptions
 - > postgres
- > Login/Group Roles
- > Tablespaces

TMDB/postgres@PostgreSQL 15

No limit

Query History

```
1 select * from genre
```

Data Output Messages Notifications

	genres	text
1	Action	
2	Adventure	
3	Western	
4	Science Fiction	
5	Drama	
6	Family	
7	Comedy	
8	Crime	
9	Romance	
10	War	

Total rows: 19 of 19 Query complete 00:00:00.071

Ln 1, Col 20



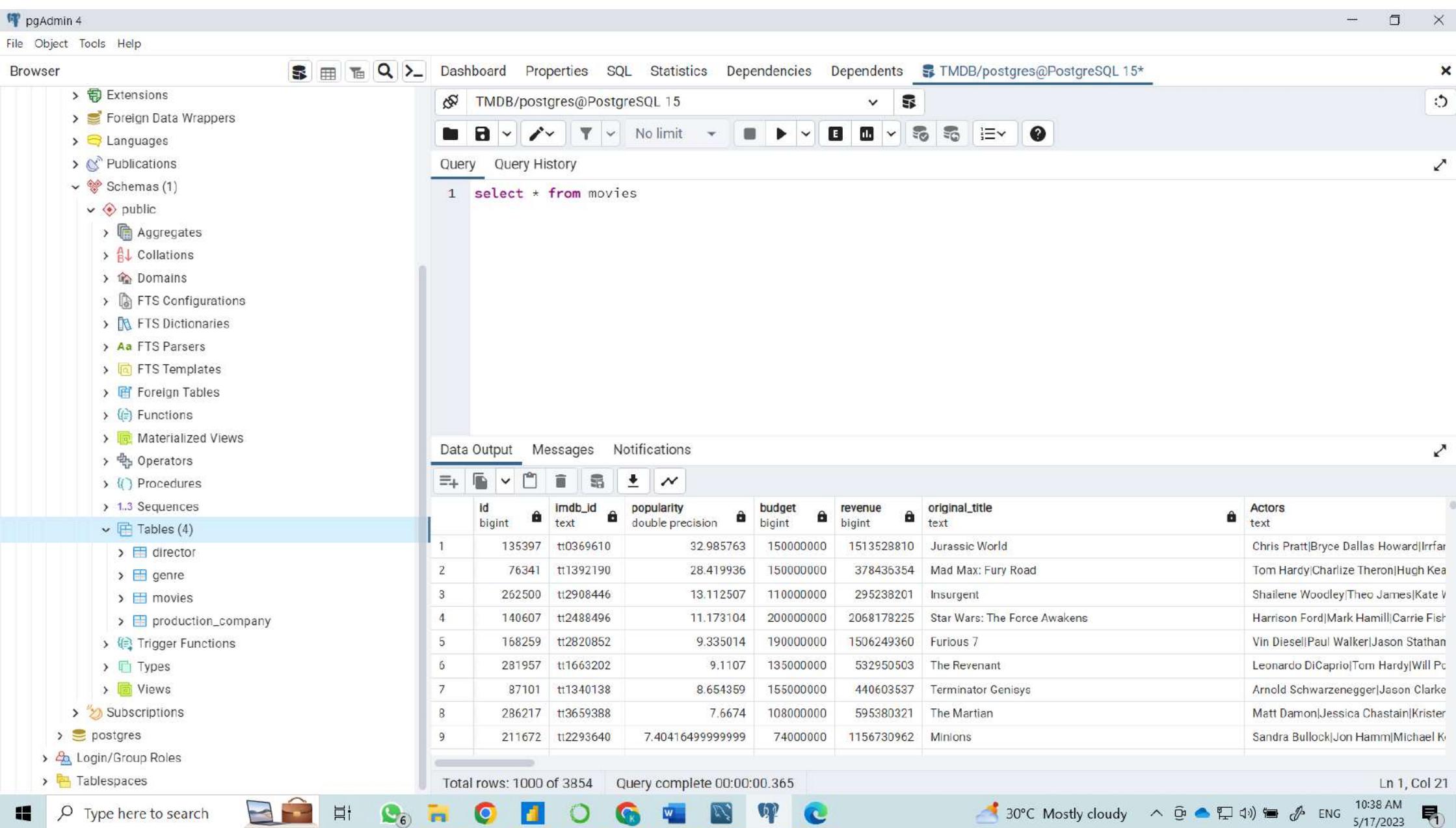
Type here to search



30°C Mostly cloudy

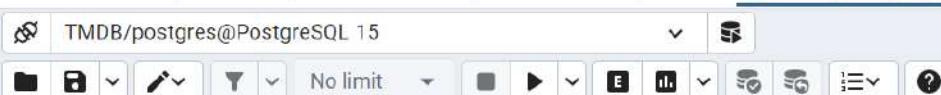
10:38 AM 5/17/2023

1





- > Extensions
- > Foreign Data Wrappers
- > Languages
- > Publications
- > Schemas (1)
 - ✓ public
 - > Aggregates
 - > Collations
 - > Domains
 - > FTS Configurations
 - > FTS Dictionaries
 - > FTS Parsers
 - > FTS Templates
 - > Foreign Tables
 - > Functions
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 - > Sequences
 - > Tables (4)
 - > director
 - > genre
 - > movies
 - > production_company
 - > Trigger Functions
 - > Types
 - > Views
- > Subscriptions
- > postgres
- > Login/Group Roles
- > Tablespaces



Query History

1 select * from production_company

Data Output Messages Notifications

	production_companies	text
1	Universal Studios	
2	Summit Entertainment	
3	Regency Enterprises	
4	Paramount Pictures	
5	Twentieth Century Fox Film Corporation	
6	Universal Pictures	
7	Walt Disney Pictures	
8	Double Feature Films	
9	Walt Disney Pictures	
10	Studio Babelsberg	

✓ Successfully run. Total query runtime: 76 msec. 19 rows affected. X

Total rows: 19 of 19 Query complete 00:00:00.076

Ln 1, Col 33



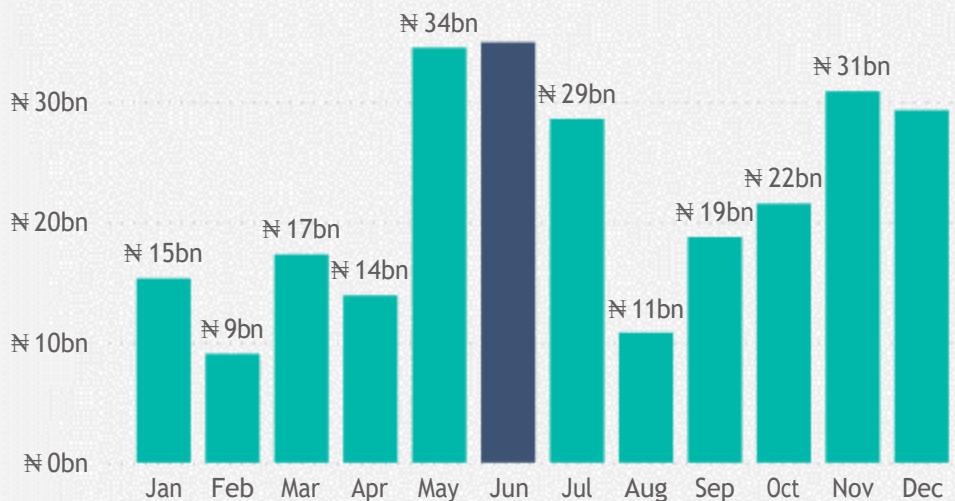
TMDB REPORT

Select Year to Filter:

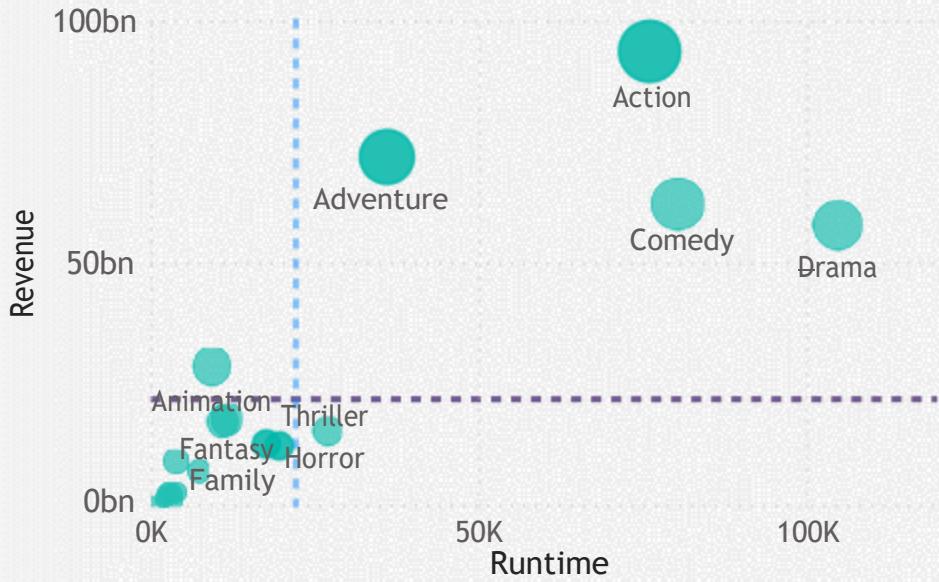
Summary (Comparison between current year selected vs the previous year)

Total Movies	Budget	Revenue	Profit
3701	₦ 142,474M	₦ 407,278M	₦ 264,804M
▲ +4.49% 3542	▲ +5.29% ₦ 135,311M	▲ +6.87% ₦ 381,079M	▲ +7.75% ₦ 245,768M

Which month had the highest and lowest profit?



Revenue vs Runtime by Genre.



Top 10 Spending Production Houses

Paramount Pictures	₦ 13bn
Universal Pictures	₦ 12bn
Columbia Pictures	₦ 10bn
Walt Disney Pictures	₦ 10bn
Twentieth Century Fox Film Corp...	₦ 7bn
Village Roadshow Pictures	₦ 5bn
New Line Cinema	₦ 5bn
DreamWorks SKG	₦ 3bn
Warner Bros.	₦ 3bn
Columbia Pictures Corporation	₦ 3bn

Quick Analysis (Movies by Budget, Revenue and Profit)

Movies	Budget	Revenue	Profit
Avatar	₦ 237,000,000	₦ 2,781,505,847	₦ 2,544,505
Star Wars: The Force Awakens	₦ 200,000,000	₦ 2,068,178,225	₦ 1,868,178,
Titanic	₦ 200,000,000	₦ 1,845,034,188	₦ 1,645,034
The Avengers	₦ 280,000,000	₦ 1,568,080,742	₦ 1,288,080
Jurassic World	₦ 150,000,000	₦ 1,513,528,810	₦ 1,363,528
Furious 7	₦ 190,000,000	₦ 1,506,249,360	₦ 1,316,249
Avengers: Age of Ultron	₦ 280,000,000	₦ 1,405,035,767	₦ 1,125,035
Harry Potter and the Deathly Hallows: Part 2	₦ 125,000,000	₦ 1,327,817,822	₦ 1,202,817
Frozen	₦ 150,000,000	₦ 1,274,219,009	₦ 1,124,219
Iron Man 3	₦ 200,000,000	₦ 1,215,439,994	₦ 1,015,439
Minions	₦ 74,000,000	₦ 1,156,730,962	₦ 1,082,730
Transformers: Dark of the Moon	₦ 195,000,000	₦ 1,123,746,996	₦ 928,746
The Lord of the Rings: The Return of the King	₦ 94,000,000	₦ 1,118,888,979	₦ 1,024,888
Skyfall	₦ 200,000,000	₦ 1,108,561,013	₦ 908,561
The Net	₦ 22,000,000	₦ 1,106,279,658	₦ 1,084,279,
The Dark Knight Rises	₦ 250,000,000	₦ 1,081,041,287	₦ 831,041
Pirates of the Caribbean: Dead Man's Chest	₦ 200,000,000	₦ 1,065,659,812	₦ 865,659
Toy Story 3	₦ 200,000,000	₦ 1,063,171,911	₦ 863,171
Alice in Wonderland	₦ 200,000,000	₦ 1,025,467,110	₦ 825,467
Pirates of the Caribbean: On Stranger Tides	₦ 380,000,000	₦ 1,021,683,000	₦ 641,683
The Hobbit: An Unexpected Journey	₦ 250,000,000	₦ 1,017,003,568	₦ 767,003,
The Dark Knight	₦ 185,000,000	₦ 1,001,921,825	₦ 816,921,
Harry Potter and the Philosopher's Stone	₦ 125,000,000	₦ 976,475,550	₦ 851,475,
Despicable Me 2	₦ 76,000,000	₦ 970,761,885	₦ 894,761,
Pirates of the Caribbean: At World's End	₦ 300,000,000	₦ 961,000,000	₦ 661,000
The Hobbit: The Desolation of Smaug	₦ 250,000,000	₦ 958,400,000	₦ 708,400
The Hobbit: The Battle of the Five Armies	₦ 250,000,000	₦ 955,119,788	₦ 705,119
Harry Potter and the Deathly Hallows: Part 1	₦ 250,000,000	₦ 954,305,868	₦ 704,305
Harry Potter and the Order of the Phoenix	₦ 150,000,000	₦ 938,212,738	₦ 788,212
Harry Potter and the Half-Blood Prince	₦ 250,000,000	₦ 933,959,197	₦ 683,959
The Lord of the Rings: The Two Towers	₦ 79,000,000	₦ 926,287,400	₦ 847,287
Star Wars: Episode I - The Phantom Menace	₦ 115,000,000	₦ 924,317,558	₦ 809,317,
Total	₦ 143,383,048,064	₦ 415,024,218,442	₦ 271,641,170