

bbdd_avanzadas_dw

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1 Práctica Base de Datos Avanzadas

1.1 Data Warehouse

<https://www.kaggle.com/tmdb/tmdb-movie-metadata>

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1.2 OBTENCIÓN DE DATOS

```
[0]: from google.colab import files

import io
import json
import pandas as pd
```

Cargamos los datos con los que vamos a trabajar:

```
[0]: def upload_files ():
    uploaded = files.upload()
    for fn in uploaded.keys():
        print('User uploaded file "{name}" with length {length} bytes'.format(
            name = fn, length = len(uploaded[fn])))
        df = pd.read_csv(io.StringIO(uploaded[fn].decode('utf-8')))
        return df
```

```
[10]: data = upload_files()
data.head()
```

<IPython.core.display.HTML object>

Saving tmdb_5000_movies.csv to tmdb_5000_movies.csv

User uploaded file "tmdb_5000_movies.csv" with length 5698602 bytes

```
[10]:      budget  ... vote_count
0  237000000  ...      11800
1  300000000  ...       4500
2  245000000  ...       4466
3  250000000  ...       9106
4  260000000  ...       2124
```

[5 rows x 20 columns]

1.3 PROCESAMIENTO

Extraemos las características que no nos interesan:

```
[11]: features = ['id', 'original_title', 'budget', 'genres',
                  'original_language', 'popularity', 'production_companies',
                  'release_date', 'revenue', 'vote_average']

df = data[features].copy()
df.head()
```

```
[11]:      id      original_title  ...      revenue
vote_average
0    19995      Avatar  ...  2787965087
7.2
1    285  Pirates of the Caribbean: At World's End  ...  961000000
6.9
2    206647      Spectre  ...  880674609
6.3
3    49026      The Dark Knight Rises  ...  1084939099
7.6
4    49529      John Carter  ...  284139100
6.1
```

[5 rows x 10 columns]

Eliminamos registros con valores nulos:

```
[0]: df = df.dropna()
```

Convertimos los registros de la columna **genres** en listas:

```
[0]: for i, row in df.iterrows():
      genre = row['genres']
      genreList = json.loads(genre)
      listGenre = []
      for g in genreList:
          listGenre.append(g["name"])
```

```
df.at[i, 'genres'] = listGenre
```

Convertimos los registros de la columna `production_companies` en listas:

```
[0]: for i, row in df.iterrows():
      companie = row['production_companies']
      companiesList = json.loads(companie)
      listCompanie = []
      for pc in companiesList:
          listCompanie.append(pc["name"])
      df.at[i, 'production_companies'] = listCompanie
```

Convertimos el formato de las fechas de AA/MM/DD a DD/MM/AA:

```
[0]: for i, row in df.iterrows():
      date = row['release_date']
      x = str(date).split('-')
      new_date = x[2] + '-' + x[1] + '-' + x[0]
      df.at[i, 'release_date'] = new_date
```

Incluimos las columnas `month` y `year`:

```
[0]: months = {
      1: 'jan',
      2: 'feb',
      3: 'mar',
      4: 'apr',
      5: 'may',
      6: 'jun',
      7: 'jul',
      8: 'aug',
      9: 'sep',
      10: 'oct',
      11: 'nov',
      12: 'dec'
    }

    for i, row in df.iterrows():
        date = row['release_date']
        x = str(date).split('-')
        df.at[i, 'month'] = months[int(x[1])]
        df.at[i, 'year'] = x[2]
```

Datos procesados:

```
[17]: df.head()
```

```
[17]:      id                original_title ... month year
0    19995                Avatar ...    dec  2009
1     285  Pirates of the Caribbean: At World's End ...    may  2007
2   206647                Spectre ...    oct  2015
3    49026      The Dark Knight Rises ...    jul  2012
4    49529        John Carter ...    mar  2012

[5 rows x 12 columns]
```

1.4 CARGA DE DATOS

Conexión y creación de la base de datos:

```
[18]: !pip install dnspython
import pymongo as pm

client = pm.MongoClient("mongodb+srv://mms:mms123@bdadatawarehouse-qalqb.
↪mongodb.net/test?retryWrites=true&w=majority")
db = client["movies_database"]
```

Requirement already satisfied: dnspython in /usr/local/lib/python3.6/dist-packages (1.16.0)

Carga de datos:

```
[0]: movies = db["movies"]
for _, row in df.iterrows():
    movies.insert_one(row.to_dict())
```

1.5 DIMENSIONES DEL DATA WAREHOUSE

Una vez cargados los datos, añadimos a nuestro almacén las diferentes dimensiones que lo componen.

1.5.1 Dimensión 1

YEAR | FILM | EARNINGS

Película más rentable de cada año:

```
[20]: dim1 = pd.DataFrame(columns=['year', 'film', 'earnings'])

for year in df['year'].unique():
    greatest = {'year': 'foo'}
    for reg in db.movies.find({"year": year}, {"year": 1, "original_title": 1,
↪ "budget": 1, "revenue": 1, "_id": 0}):
        earnings = reg['revenue'] - reg['budget']
```

```

    if (year not in greatest['year']) or earnings > greatest['earnings']:
        greatest['year'] = reg['year']
        greatest['film'] = reg['original_title']
        greatest['earnings'] = earnings
    dim1 = dim1.append(greatest, ignore_index=True)

dim1.sort_values(by=['year'], inplace=True)
dim1

```

```

[20]:      year      film  earnings
87  1916  Intolerance   8008844
89  1925  The Big Parade  21755000
53  1927   Metropolis -91969578
84  1929  The Broadway Melody   3979000
69  1930  Hell's Angels   4050000
..   ...
8   2013    Frozen  1124219009
10  2014 Transformers: Age of Extinction  881405097
2   2015    Jurassic World  1363528810
5   2016  Captain America: Civil War   903304495
80  2017    Growing Up Smith         0

```

[90 rows x 3 columns]

Cargamos la nueva dimensión en la base de datos:

```

[0]: earnings_movies = db["earnings_movies"]
    for _, row in dim1.iterrows():
        earnings_movies.insert_one(row.to_dict())

```

1.5.2 Dimensión 2

YEAR | NUMBER OF FILMS | JAN | FEB | MARCH | ... | NOV | DEC

Películas por mes cada año:

```

[22]: dim2 = pd.DataFrame(columns=['year', 'total', 'jan', 'feb', 'mar', 'apr', 'may',
    'jun', 'jul', 'aug', 'sep', 'oct', 'nov', 'dec'])

for year in df['year'].unique():
    total = 0
    films_year = {'year': 'foo', 'total': 0, 'jan': 0, 'feb': 0, 'mar': 0, 'apr': 0,
    'may': 0,
    'jun': 0, 'jul': 0, 'aug': 0, 'sep': 0, 'oct': 0, 'nov': 0, 'dec': 0}
    for movie in db.movies.find({"year": year}, {"year": 1, "month": 1, "_id": 0}):
        total += 1
        films_year[movie['month']] += 1

```

```

films_year['year'] = year
films_year['total'] = total
dim2 = dim2.append(films_year, ignore_index=True)

dim2.sort_values(by=['year'], inplace=True)
dim2

```

```

[22]:      year total  jan feb mar apr may jun jul aug sep oct nov dec
87  1916      1   0   0   0   0   0   0   0   0   1   0   0   0
89  1925      1   0   0   0   0   0   0   0   0   0   0   1   0
53  1927      1   1   0   0   0   0   0   0   0   0   0   0   0
84  1929      2   1   1   0   0   0   0   0   0   0   0   0   0
69  1930      1   0   0   0   0   0   0   0   0   0   0   1   0
..    ...    ...
8   2013     231  19  18  17  15  16  15  26  18  26  23  14  24
10  2014     238  22  11  18  18  19  20  16  24  24  28  15  23
2   2015     216  13  19  17  17  10  14  19  22  26  27  17  15
5   2016     104  17  14  13  11  13  12  15   4   4   1   0   0
80  2017      1   0   1   0   0   0   0   0   0   0   0   0   0

```

[90 rows x 14 columns]

Cargamos la nueva dimensión en la base de datos:

```

[0]: films_by_year = db["films_by_year"]
for _, row in dim2.iterrows():
    films_by_year.insert_one(row.to_dict())

```

1.5.3 Dimensión 3

GENRE | AVERAGE_POPULARITY | AVERAGE_VOTES

Popularidad y votaciones medias por género.

- Primero, obtenemos todos los géneros del dataset:

```

[24]: all_genres = []
for list_genres in df['genres']:
    for genre in list_genres:
        if genre not in all_genres:
            all_genres.append(genre)
all_genres

```

```

[24]: ['Action',
      'Adventure',
      'Fantasy',
      'Science Fiction',

```

```
'Crime',  
'Drama',  
'Thriller',  
'Animation',  
'Family',  
'Western',  
'Comedy',  
'Romance',  
'Horror',  
'Mystery',  
'History',  
'War',  
'Music',  
'Documentary',  
'Foreign',  
'TV Movie']
```

Creamos una colección de votos y popularidades:

```
[25]: info_genres = {}  
      for genre in all_genres:  
          key_popularity = genre + '_pop'  
          key_votes = genre + '_votes'  
  
          info_genres[key_popularity] = []  
          info_genres[key_votes] = []  
      info_genres
```

```
[25]: {'Action_pop': [],  
      'Action_votes': [],  
      'Adventure_pop': [],  
      'Adventure_votes': [],  
      'Animation_pop': [],  
      'Animation_votes': [],  
      'Comedy_pop': [],  
      'Comedy_votes': [],  
      'Crime_pop': [],  
      'Crime_votes': [],  
      'Documentary_pop': [],  
      'Documentary_votes': [],  
      'Drama_pop': [],  
      'Drama_votes': [],  
      'Family_pop': [],  
      'Family_votes': [],  
      'Fantasy_pop': [],  
      'Fantasy_votes': [],  
      'Foreign_pop': [],
```

```

'Foreign_votes': [],
'History_pop': [],
'History_votes': [],
'Horror_pop': [],
'Horror_votes': [],
'Music_pop': [],
'Music_votes': [],
'Mystery_pop': [],
'Mystery_votes': [],
'Romance_pop': [],
'Romance_votes': [],
'Science Fiction_pop': [],
'Science Fiction_votes': [],
'TV Movie_pop': [],
'TV Movie_votes': [],
'Thriller_pop': [],
'Thriller_votes': [],
'War_pop': [],
'War_votes': [],
'Western_pop': [],
'Western_votes': []}

```

- Después, calculamos las medias:

```

[26]: dim3 = pd.DataFrame(columns=['genre', 'average_popularity', 'average_votes'])

for _, movie in df.iterrows():
    movie_genres = movie['genres']
    for genre in movie_genres:
        key_popularity = genre + '_pop'
        key_votes = genre + '_votes'
        info_genres[key_popularity].append(movie['popularity'])
        info_genres[key_votes].append(movie['vote_average'])

row = {'genre': 'foo', 'average_popularity': 0, 'average_votes': 0}
for genre in all_genres:
    row['genre'] = genre

    popularities = info_genres[genre + '_pop']
    votes = info_genres[genre + '_votes']

    row['average_popularity'] = sum(popularities)/len(popularities)
    row['average_votes'] = sum(votes)/len(votes)

    dim3 = dim3.append(row, ignore_index=True)

dim3

```



```
[26]:
```

	genre	average_popularity	average_votes
0	Action	30.940382	5.989515
1	Adventure	39.268042	6.156962
2	Fantasy	36.387043	6.096698
3	Science Fiction	36.451806	6.005607
4	Crime	22.853274	6.274138
5	Drama	17.764853	6.388594
6	Thriller	24.460077	6.010989
7	Animation	38.813439	6.341453
8	Family	27.832849	6.029630
9	Western	18.236279	6.178049
10	Comedy	18.221001	5.945587
11	Romance	15.962426	6.207718
12	Horror	18.295915	5.626590
13	Mystery	24.586827	6.183908
14	History	17.444839	6.719797
15	War	23.777289	6.713889
16	Music	13.101512	6.355676
17	Documentary	3.945724	6.238182
18	Foreign	0.686787	6.352941
19	TV Movie	6.389415	5.662500

Cargamos la nueva dimensión en la base de datos:

```
[0]: genres_popularity = db["genres_popularity"]
for _, row in dim3.iterrows():
    genres_popularity.insert_one(row.to_dict())
```

1.5.4 Dimensión 4

PRODUCTION_COMPANY | EARNINGS

Ganancias totales por productora:

```
[28]: all_companies = []
for list_companies in df['production_companies']:
    for companies in list_companies:
        if companies not in all_companies:
            all_companies.append(companies)
all_companies
```

```
[28]: ['Ingenious Film Partners',
       'Twentieth Century Fox Film Corporation',
       'Dune Entertainment',
       'Lightstorm Entertainment',
       'Walt Disney Pictures',
       'Jerry Bruckheimer Films',
```

'Second Mate Productions',
'Columbia Pictures',
'Danjaq',
'B24',
'Legendary Pictures',
'Warner Bros.',
'DC Entertainment',
'Syncopy',
'Laura Ziskin Productions',
'Marvel Enterprises',
'Walt Disney Animation Studios',
'Marvel Studios',
'Prime Focus',
'Revolution Sun Studios',
'Heyday Films',
'DC Comics',
'Atlas Entertainment',
'Cruel & Unusual Films',
'RatPac-Dune Entertainment',
'Bad Hat Harry Productions',
'Eon Productions',
'Infinitum Nihil',
'Silver Bullet Productions (II)',
'Blind Wink Productions',
'Classic Media',
'Cruel and Unusual Films',
'Walt Disney',
'Walden Media',
'Stillking Films',
'Ozumi Films',
'Propeler',
'Silverbell Films',
'Paramount Pictures',
'Moving Picture Company (MPC)',
'Amblin Entertainment',
'Media Magik Entertainment',
'Imagination Abu Dhabi FZ',
'Hemisphere Media Capital',
'Parkes/MacDonald Productions',
'WingNut Films',
'New Line Cinema',
'Warner Bros. Pictures',
'3Foot7',
'Metro-Goldwyn-Mayer (MGM)',
'Marvel Entertainment',
'Imagine Entertainment',
'Universal Pictures',

'Scott Free Productions',
'Relativity Media',
'Depth of Field',
'Scholastic Productions',
'Big Primate Pictures',
'MFPV Film',
'Studio Babelsberg',
'Walt Disney Studios Motion Pictures',
'Vita-Ray Dutch Productions (III)',
'Deluxe Digital Studios',
'Hasbro',
'Bluegrass Films',
'Film 44',
'Universal Studios',
'Fuji Television Network',
'Dentsu',
'Team Todd',
'Tim Burton Productions',
'Roth Films',
'Zanuck Company, The',
'Donners' Company',
'Major Studio Partners',
'thinkfilm',
'X3 Canada Productions',
'X3US Productions',
'XM3 Service',
'Pixar Animation Studios',
'DreamWorks SKG',
'Di Bonaventura Pictures',
'Platinum Dunes',
'Hasbro Studios',
'China Movie Channel',
'Ian Bryce Productions',
'Avi Arad Productions',
'Matt Tolmach Productions',
'LivePlanet',
'Prana Studios',
'Sean Bailey Productions',
'Kontsept Film Company',
'De Line Pictures',
'The Halcyon Company',
'Wonderland Sound and Vision',
'Original Film',
'One Race Films',
'China Film Co.',
'Québec Production Services Tax Credit',
'Media Rights Capital (MRC)',

'Abu Dhabi Film Commission',
'Colorado Office of Film, Television & Media',
'GK Films',
'Skydance Productions',
'Apparatus Productions',
'Latina Pictures',
'2DUX²',
'TSG Entertainment',
'Down Productions',
'Bad Robot',
'Kurtzman/Orci',
'Big Kid Pictures',
'Village Roadshow Pictures',
'Bazmark Films',
'A&E Television Networks',
'Red Wagon Entertainment',
'Spectrum Films',
'Disney Double Dare You (DDY)',
'Indochina Productions',
'Lucasfilm',
'Perfect Storm Entertainment',
'Alibaba Pictures Group',
'Skydance Media',
'Sneaky Shark',
'Huahua Media',
'FortyFour Studios',
'Centropolis Entertainment',
'The Mark Gordon Company',
'Farewell Productions',
'ImageMovers',
'Anarchos Productions',
'Dark Horse Entertainment',
'Jerry Weintraub Productions',
'Beagle Pug Films',
'Riche Productions',
'Village Roadshow Films North America',
'Kinberg Genre',
'DreamWorks Animation',
'Todman, Simon, LeMasters Productions',
'Peters Entertainment',
'Sonnenfeld Josephson Worldwide Entertainment',
'China Film Co-Production Corporation',
'Alphaville Films',
'Sommers Company, The',
'Spyglass Entertainment',
'Shady Acres Entertainment',
'Playtone',

'Viz Media',
'Province of British Columbia Production Services Tax Credit',
'3 Arts Entertainment',
'Gordon Company',
'Davis Entertainment',
'Licht/Mueller Film Corporation',
'Fairview Entertainment',
'Ingenious Media',
'Chernin Entertainment',
'Corsan',
'Bliss Media',
'Limelight International Media Entertainment',
'Neelmudra Entertainment',
'Aristos Films',
'Singularity Productions',
'Wildkite',
'Mid Atlantic Films',
'Stuber Productions',
'Universal',
'H2F Entertainment',
'Babieka',
'A113',
'Golden Mean',
'Stereo D',
'Vertigo Entertainment',
'Mad Hatter Entertainment',
'Intermedia Films',
'C-2 Pictures',
'IMF Internationale Medien und Film GmbH & Co. 3. Produktions KG',
'Mostow/Lieberman Productions',
'Bulletproof Cupid',
'Lynda Obst Productions',
'Cine Bazar',
'Toho Pictures',
'Ardustry Entertainment',
'Mediastream Film GmbH & Co. Productions KG',
'Kennedy/Marshall Company, The',
'Dune Entertainment III',
'Big Screen Productions',
'Lionsgate',
'Color Force',
'Saturn Films',
'Broken Road Productions',
'Junction Entertainment',
'Virtual Studios',
'Next Entertainment',
'Irwin Allen Productions',

'Radiant Productions',
'Synthesis Entertainment',
'Legend3D',
'Blizzard Entertainment',
'Annapurna Pictures',
'Fox 2000 Pictures',
'Touchstone Pictures',
'SprocketHeads',
'France 3 Cinéma',
'Pathé Renn Productions',
'Egmond Film & Television',
'Pacifica Film',
'WR Universal Group',
'Patalex IV Productions Limited',
'Weed Road Pictures',
'Forward Pass',
'Overbrook Entertainment',
'Blue Light',
'GH Three',
'The Zanuck Company',
'Plan B Entertainment',
'Theobald Film Productions',
'Patalex III Productions Limited',
'1492 Pictures',
'21 Laps Entertainment',
'Museum Canada Productions',
'Seed Productions',
'NPV Entertainment',
'Silver Pictures',
'Heineken Branded Entertainment',
'Kennedy Miller Productions',
'Panorama Films',
'Skylark Productions',
'Whamaphram Productions',
'Thunder Road Pictures',
'Cott Productions',
'Furia de Titanes II, A.I.E.',
'Dan Curtis Productions',
'TC Productions',
'Odin',
'Pacific Data Images (PDI)',
'Columbus 81 Productions',
'Nickelodeon Movies',
'Industrial Light & Magic (ILM)',
'Blinding Edge Pictures',
'Cruise/Wagner Productions',
'MI 3 Film',

'China Film Group Corporation (CFGC)',
'The Fourth Production Company Film Group',
'Iron Horse Entertainment (II)',
'Mythology Entertainment (II)',
'Aardman Animations',
'Berlanti Productions',
'Classic Media Productions',
'Bullwinkle Studios',
'Nimar Studios',
'Helena Productions',
'Montecito Picture Company, The',
'LStar Capital',
'Feigco Entertainment',
'Pascal Pictures',
'Ghostcorps',
'Valhalla Motion Pictures',
'Columbia Pictures Corporation',
'Parkes+MacDonald Image Nation',
'Shangri-La Entertainment',
'Paramount Animation',
'Oriental DreamWorks',
'JC 23 Entertainment',
'Radar Pictures',
'Bedford Falls Company, The',
'Volcano Films',
'MavroCine Pictures GmbH & Co. KG',
'Summit Entertainment',
'Mystery Clock Cinema',
'TIK Films',
'Pyramania',
'Phoenix Pictures',
'AFG Talons Productions',
'Lawrence Gordon Productions',
'Donner/Shuler-Donner Productions',
'Good Machine',
'Saints LA',
'Bristol Bay Productions',
'Baldwin Entertainment Group',
'Desertlands Entertainment',
'Mace Neufeld Productions',
'Kanzaman',
'J.K. Livin Productions',
'Moguletta',
'Sahara Productions',
'Babelsberg Film',
'Square USA',
'Chris Lee Productions',

'Samuel Goldwyn Films',
'Miramax',
'Sunswept Entertainment',
'Temple Hill Entertainment',
'Dr D Studios',
'Kennedy Miller Mitchell',
'MVL Incredible Productions',
'Reliance Entertainment',
'Regency Enterprises',
'Appian Way',
'CatchPlay',
'Anonymous Content',
'New Regency Pictures',
'Hong Kong Alpha Motion Pictures Co.',
'RatPac Entertainment',
'M Productions',
'Monarchy Enterprises S.a.r.l.',
'Blind Wink',
'The Kennedy/Marshall Company',
'Ludlum Entertainment',
'Motion Picture BETA Produktionsgesellschaft',
'Bourne Again',
'Don Simpson/Jerry Bruckheimer Films',
'DreamWorks',
'Wintergreen Productions',
'Protozoa Pictures',
'Disruption Entertainment',
'Heyday films',
'ScreenWest',
'Walt Disney Feature Animation',
'Government of Malta',
'Blue Sky Studios',
'Twentieth Century Fox Animation',
'XM2 Productions',
'XF2 Canada Productions',
'One Race Productions',
'Lin Pictures',
'Wigram Productions',
'TriStar Pictures',
'Carolco Pictures',
'Carolco International N.V.',
'Captivate Entertainment',
'PolyGram Filmed Entertainment',
'Lions Gate Films',
'Mark Gordon Productions',
'Mel's Cite du Cinema',
'Munich Film Partners & Company (MFP) MI2 Productions',

'Baltimore Spring Creek Productions',
'Constantin Film Produktion',
'Bernd Eichinger Productions',
'Haishang Films',
'Michael De Luca Productions',
'Crystal Sky Pictures',
'GH One',
'Vengeance Productions Pty. Ltd.',
'Pearl Street Films',
'Double Negative',
'Perfect World (Beijing) Pictures Co.',
'Tall Trees Productions',
'Flower Films (II)',
'Brandywine Productions',
'Sony Pictures Entertainment',
'Media Rights Capital',
'Sony Pictures Entertainment (SPE)',
'QED International',
'Alpha Core',
'Genre Films',
'Simon Kinberg Productions',
'Strike Entertainment',
'Velocity Productions',
'Gracie Films',
'Road Rebel',
'Tree Line Films',
'Pink Machine',
'Monolith Pictures (III)',
'Radical Studios',
'Constantin Film',
'TF1 Films Productions',
'La Petite Reine',
'Tri Pictures',
'Sorolla Films',
'Novo RPI',
'Canal+',
'uFilm',
'Canal+ España',
'Le Tax Shelter du Gouvernement Fédéral de Belgique',
'Les Editions Albert René',
'Lion Rock Productions',
'Perfect World Pictures',
'Esperanto Filmoj',
'Pacific Western',
'5150 Action',
'Gama Entertainment Partners',
'Marv Films',

'Constantin Film.',
'Flynn Picture Company',
'Mutual Film Company',
'Global Entertainment Productions GmbH & Company Medien KG',
'Section Eight',
'WV Films III',
'Epsilon Motion Pictures',
'Mandeville Films',
'NeoReel',
'Miramax Films',
'Cappa Productions',
'Initial Entertainment Group (IEG)',
'Reliance BIG Entertainment',
'Hollywood Gang Productions',
'Atmosphere Entertainment MM',
'Sony Pictures Animation',
'Kerner Entertainment Company',
'Angry Films',
'Wardour Street Pictures',
'Blue Tulip Productions',
'Chartoff Productions',
'Odd Lot Entertainment',
'K/O Paper Products',
'Digital Domain',
'Taleswapper',
'Cheyenne Enterprises',
'The Saul Zaentz Company',
'80 Days Productions',
'Spanknyce Films',
'Fitzwilliam Productions',
'Laurence Mark Productions',
'Mediastream Vierte Film GmbH & Co. Vermarktungs KG',
'Canlaws Productions',
'Dune Films',
'BK',
'KOH',
'Reino del Cielo',
'Inside Track 3',
'Calle Cruzada',
'Global Medien KG',
'Franklin/Waterman Productions',
'International Traders',
'Mill Film',
'C & L',
'Dawliz',
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'Straight Up Films',
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'The Steve Tisch Company_earnings': [],
'Teitler Film_earnings': [],
'Taurus Film_earnings': [],
'Linson Films_earnings': [],
'Atman Entertainment_earnings': [],
'Knickerbocker Films_earnings': [],
'Sidney Kimmel Entertainment_earnings': [],
'Hopscotch Films_earnings': [],

'R.P. Productions_earn': [],
 'Runteam III Ltd._earn': [],
 'Elektra Productions_earn': [],
 'SAI Productions_earn': [],
 'Troublemaker Studios_earn': [],
 'AR Films_earn': [],
 'Aldamisa Entertainment_earn': [],
 'Demarest Films_earn': [],
 'Solipsist Film_earn': [],
 'Residaco_earn': [],
 'Cross Creek Pictures_earn': [],
 'Free State Pictures_earn': [],
 'RVK Studios_earn': [],
 'Rising Star_earn': [],
 'VIP Medienfonds 4_earn': [],
 'Ikiru Films_earn': [],
 'Castelao Producciones_earn': [],
 "Eric's Boy_earn": [],
 'Moving Pictures_earn': [],
 'Gratitude International_earn': [],
 'Tezuka Production Company Ltd._earn': [],
 'Imagi Animation Studios_earn': [],
 'Paragon Entertainment Corp._earn': [],
 'Shanghai Film Group_earn': [],
 'Jackie & JJ Production_earn': [],
 'Sparkle Roll Media_earn': [],
 'Home Media & Entertainment Fund_earn': [],
 'Tencent Video_earn': [],
 'China Film & TV Capital_earn': [],
 'Visualizer Film Company_earn': [],
 'Wayans Bros. Entertainment_earn': [],
 'Internationale Filmproduktion_earn': [],
 'FilmColony_earn': [],
 'Wild Hogs Productions_earn': [],
 'Pacific Standard_earn': [],
 'Artemple - Hollywood_earn': [],
 'Neufeld Rehme Productions_earn': [],
 'Envision Entertainment Corporation_earn': [],
 'Zide-Perry Productions_earn': [],
 'BenderSpink_earn': [],
 'Fortis Films_earn': [],
 'Dozen Canada Productions_earn': [],
 'Gotham Group_earn': [],
 'Red Om Films_earn': [],
 'Ixtlan_earn': [],
 'Wildwood Enterprises_earn': [],
 'Edge City_earn': [],

```

'World Wrestling Entertainment (WWE)_earnings': [],
'Beacon Pictures_earnings': [],
'Fantail Films Inc._earnings': [],
'Riche-Ludwig Productions_earnings': [],
'Groucho III Film Partnership_earnings': [],
'Focus Features_earnings': [],
'Laika Entertainment_earnings': [],
'UTV Motion Pictures_earnings': [],
'AR-TL_earnings': [],
'Starlite Films_earnings': [],
'Province of British Columbia Film Incentive BC_earnings': [],
'Solomon/Hackett Productions_earnings': [],
'Larger Than Life Productions_earnings': [],
'Blue Train Productions_earnings': [],
'Seagal/Nasso Productions_earnings': [],
'Victor Company of Japan (JVC)_earnings': [],
'Cutting Edge Films_earnings': [],
'Etalon film_earnings': [],
'Buckaroo Entertainment_earnings': [],
'LHF Film_earnings': [],
'Gerard Butler Alan Siegel Entertainment_earnings': [],
'Nu Boyana Film Studios_earnings': [],
'Grosvenor Park Impact Productions_earnings': [],
'LEGO_earnings': [],
'Warner Animation Group_earnings': [],
'World 2000 Entertainment_earnings': [],
'Tripod Entertainment_earnings': [],
'Langley Park Production_earnings': [],
...}

```

```

[30]: dim4 = pd.DataFrame(columns=['production_company', 'earnings'])

for _, movie in df.iterrows():
    movie_companies = movie['production_companies']
    for companie in movie_companies:
        key_earnings = companie + '_earnings'
        earnings = movie['revenue'] - movie['budget']
        info_companies[key_earnings].append(earnings)

row = {'production_company': 'foo', 'earnings': 0}
for companie in all_companies:
    row['production_company'] = companie
    earnings = info_companies[companie + '_earnings']
    row['earnings'] = sum(earnings)
    dim4 = dim4.append(row, ignore_index=True)

dim4

```

```
[30]:
```

	production_company	earnings
0	Ingenious Film Partners	5438230983
1	Twentieth Century Fox Film Corporation	28529983509
2	Dune Entertainment	9776504187
3	Lightstorm Entertainment	4899881784
4	Walt Disney Pictures	19099976048
...
5012	FM Entertainment	0
5013	Eagle Eye Films Inc.	0
5014	Front Street Pictures	0
5015	rusty bear entertainment	0
5016	lucky crow films	0

[5017 rows x 2 columns]

Cargamos la nueva dimensión en la base de datos:

```
[0]: earnings_companies = db["earnings_companies"]
for _, row in dim4.iterrows():
    earnings_companies.insert_one(row.to_dict())
```

1.5.5 Dimensión 5

LANGUAGE | FILM | AVERAGE_POPULARITY

Película más popular para cada idioma:

```
[32]: dim5 = pd.DataFrame(columns=['language', 'film', 'average_popularity'])

for language in df['original_language'].unique():
    greatest = {'language': 'foo', 'film': 'foo', 'average_popularity': -1}
    for reg in db.movies.find({"original_language": language},
    ↪{"original_language": 1, "original_title": 1, "popularity": 1, "_id": 0}):
        popularity = reg['popularity']
        if popularity > greatest['average_popularity']:
            greatest['language'] = reg['original_language']
            greatest['film'] = reg['original_title']
            greatest['average_popularity'] = popularity
    dim5 = dim5.append(greatest, ignore_index=True)

dim5
```

```
[32]:
```

	language	film	average_popularity
0	en	Minions	875.581305
1	ja		118.968562
2	fr	Le fabuleux destin d'Amélie Poulain	73.720244
3	zh		45.742254

4	es	El laberinto del fauno	90.809408
5	de	Das Leben der Anderen	34.938177
6	hi	Dabba	14.017809
7	ru		24.132271
8	ko	Snowpiercer	64.238688
9	te	Baahubali: The Beginning	16.254032
10	cn	3	19.167377
11	it	Il buono, il brutto, il cattivo	88.377076
12	nl	Zwartboek	13.906611
13	ta		0.416179
14	sv	Viskningar och rop	11.347855
15	th		11.818320
16	da	What Happens in Vegas	38.100488
17	xx	La Guerre du feu	6.537986
18	hu	Sorstalanság	1.906807
19	cs	Obsluhoval jsem anglického krále	2.387463
20	pt	Cidade de Deus	44.356711
21	is	Hross í oss	1.617943
22	tr	Kurtlar vadisi - Irak	1.465762
23	nb	Trolljegeren	12.982319
24	af	Tsotsi	2.504169
25	pl	Ida	13.265432
26	he	Vals Im Bashir	14.082510
27	ar	The Square	4.892203
28	vi	Vượt Sóng	0.072066
29	ky	Kurmanjan Datka. Queen of the Mountains	0.077873
30	id	Serbuan maut	40.285095
31	ro	4 luni, 3 săptămîni și 2 zile	9.270133
32	fa		12.049373
33	no	Død snø	11.205726
34	sl	Julija in Alfa Romeo	0.061248
35	ps	Osama	1.447734
36	el	K	28.858238

Cargamos la nueva dimensión en la base de datos:

```
[0]: popularity_lang = db["popularity_lang"]
for _, row in dim5.iterrows():
    popularity_lang.insert_one(row.to_dict())
```

1.6 CONSULTAS AL DATA WAREHOUSE

Una vez incluidas las dimensiones, es posible acceder a ellas mediante consultas al almacén de datos:

1.6.1 Consulta a dimensión 1

```
[34]: query_dim1 = pd.DataFrame()

for document in db.earnings_movies.find({}, {"_id": 0}):
    query_dim1 = query_dim1.append(document, ignore_index=True)

query_dim1 = query_dim1[['year', 'film', 'earnings']]
query_dim1.sort_values(by='year')
```

```
[34]:      year      film      earnings
0   1916  Intolerance  8.008844e+06
1   1925  The Big Parade  2.175500e+07
2   1927    Metropolis -9.196958e+07
3   1929  The Broadway Melody  3.979000e+06
4   1930   Hell's Angels  4.050000e+06
..  ...
85  2013     Frozen  1.124219e+09
86  2014 Transformers: Age of Extinction  8.814051e+08
87  2015    Jurassic World  1.363529e+09
88  2016  Captain America: Civil War  9.033045e+08
89  2017   Growing Up Smith  0.000000e+00
```

[90 rows x 3 columns]

1.6.2 Consulta a dimensión 2

```
[35]: query_dim2 = pd.DataFrame()

for document in db.films_by_year.find({}, {"_id": 0}):
    query_dim2 = query_dim2.append(document, ignore_index=True)

query_dim2 = query_dim2[['year', 'total', 'jan', 'feb', 'mar', 'apr', 'may', 'jun', 'jul', 'aug', 'sep', 'oct', 'nov', 'dec']]
query_dim2.sort_values(by='year')
```

```
[35]:      year  total  jan  feb  mar  apr  ...  jul  aug  sep  oct  nov  dec
0   1916     1.0   0.0   0.0   0.0   0.0  ...   0.0   0.0   1.0   0.0   0.0   0.0
1   1925     1.0   0.0   0.0   0.0   0.0  ...   0.0   0.0   0.0   0.0   1.0   0.0
2   1927     1.0   1.0   0.0   0.0   0.0  ...   0.0   0.0   0.0   0.0   0.0   0.0
3   1929     2.0   1.0   1.0   0.0   0.0  ...   0.0   0.0   0.0   0.0   0.0   0.0
4   1930     1.0   0.0   0.0   0.0   0.0  ...   0.0   0.0   0.0   0.0   1.0   0.0
..  ...
85  2013   231.0  19.0  18.0  17.0  15.0  ...  26.0  18.0  26.0  23.0  14.0  24.0
86  2014   238.0  22.0  11.0  18.0  18.0  ...  16.0  24.0  24.0  28.0  15.0  23.0
87  2015   216.0  13.0  19.0  17.0  17.0  ...  19.0  22.0  26.0  27.0  17.0  15.0
```

```

88 2016 104.0 17.0 14.0 13.0 11.0 ... 15.0 4.0 4.0 1.0 0.0 0.0
89 2017 1.0 0.0 1.0 0.0 0.0 ... 0.0 0.0 0.0 0.0 0.0 0.0

```

[90 rows x 14 columns]

1.6.3 Consulta a dimensión 3

```

[36]: query_dim3 = pd.DataFrame()

for document in db.genres_popularity.find({}, {"_id": 0}):
    query_dim3 = query_dim3.append(document, ignore_index=True)

query_dim3 = query_dim3[['genre', 'average_popularity', 'average_votes']]
query_dim3.sort_values(by='genre')

```

```

[36]:
   genre  average_popularity  average_votes
0   Action             30.940382           5.989515
1  Adventure             39.268042           6.156962
7  Animation             38.813439           6.341453
10  Comedy              18.221001           5.945587
4   Crime               22.853274           6.274138
17  Documentary           3.945724           6.238182
5   Drama              17.764853           6.388594
8   Family              27.832849           6.029630
2   Fantasy              36.387043           6.096698
18  Foreign              0.686787           6.352941
14  History              17.444839           6.719797
12  Horror               18.295915           5.626590
16  Music               13.101512           6.355676
13  Mystery              24.586827           6.183908
11  Romance              15.962426           6.207718
3  Science Fiction       36.451806           6.005607
19  TV Movie              6.389415           5.662500
6   Thriller             24.460077           6.010989
15   War                23.777289           6.713889
9   Western             18.236279           6.178049

```

1.6.4 Consulta a dimensión 4

```

[37]: query_dim4 = pd.DataFrame()

for document in db.earnings_companies.find({}, {"_id": 0}):
    query_dim4 = query_dim4.append(document, ignore_index=True)

query_dim4 = query_dim4[['production_company', 'earnings']]

```



```
query_dim4.sort_values(by='production_company')
```

```
[37]:
```

	production_company	earnings
1536	"DIA" Productions GmbH & Co. KG	8350926.0
4808	1.85 Films	-401983.0
4325	10 West Studios	0.0
2258	100 Bares	33965843.0
4362	1019 Entertainment	801508.0
...
2250	verture Films	0.0
1350	warner bross Turkey	280170008.0
3069	winchester films	0.0
4577	África Filmes	0.0
2927	Österreichischer Rundfunk (ORF)	73841160.0

```
[5017 rows x 2 columns]
```

1.6.5 Consulta a dimensión 5

```
[38]: query_dim5 = pd.DataFrame()

for document in db.popularity_lang.find({}, {"_id": 0}):
    query_dim5 = query_dim5.append(document, ignore_index=True)

query_dim5 = query_dim5[['language', 'film', 'average_popularity']]
query_dim5.sort_values(by='language')
```

```
[38]:
```

	language	film	average_popularity
24	af	Tsotsi	2.504169
27	ar	The Square	4.892203
10	cn	3	19.167377
19	cs	Obsluhoval jsem anglického krále	2.387463
16	da	What Happens in Vegas	38.100488
5	de	Das Leben der Anderen	34.938177
36	el	K	28.858238
0	en	Minions	875.581305
4	es	El laberinto del fauno	90.809408
32	fa		12.049373
2	fr	Le fabuleux destin d'Amélie Poulain	73.720244
26	he	Vals Im Bashir	14.082510
6	hi	Dabba	14.017809
18	hu	Sorstalanság	1.906807
30	id	Serbuan maut	40.285095
21	is	Hross í oss	1.617943
11	it	Il buono, il brutto, il cattivo	88.377076
1	ja		118.968562

8	ko	Snowpiercer	64.238688
29	ky	Kurmanjan Datka. Queen of the Mountains	0.077873
23	nb	Trolljegeren	12.982319
12	nl	Zwartboek	13.906611
33	no	Død snø	11.205726
25	pl	Ida	13.265432
35	ps	Osama	1.447734
20	pt	Cidade de Deus	44.356711
31	ro	4 luni, 3 săptămîni și 2 zile	9.270133
7	ru		24.132271
34	sl	Julija in Alfa Romeo	0.061248
14	sv	Viskningar och rop	11.347855
13	ta		0.416179
9	te	Baahubali: The Beginning	16.254032
15	th		11.818320
22	tr	Kurtlar vadisi - Irak	1.465762
28	vi	Vượt Sóng	0.072066
17	xx	La Guerre du feu	6.537986
3	zh		45.742254