Analisis de datos de Steam

1. Librerias y funciones utiles

Cargando librerias

```
# Import any packages here
import gzip
import pandas as pd
import nltk
#import spacy
from collections import defaultdict
import numpy as np
from matplotlib import pyplot as plt
from sklearn import linear_model
import math
from numpy import nan
from google.colab import drive
import matplotlib.pyplot as plt
import seaborn as sns
from nltk.sentiment.vader import SentimentIntensityAnalyzer
```

funciones utiles

```
# Define any functions here
def readCSV(path):
    f = gzip.open(path, 'rt', encoding="utf8")
    values = []
    for line in f:
        fields = eval(line)
        values.append(fields)
    return values


NaN = float('nan')
false = False
true=  True
```

2. Cargando Dataset

Cargando datasets

```
# lectura de datos de python
steam_games = readCSV("/content/drive/MyDrive/steam_games.json.gz")
users_reviews = readCSV("/content/drive/MyDrive/user_reviews.json.gz")
users_items = readCSV("/content/drive/MyDrive/users_items.json.gz")
```

Segun el diccionario de datos :

- Diccionario de datos

Games

```
game_id, price, developer, publisher, genres, app_name, release_date, metascore, specs, early_access, reviews_url, discount_pric
```

```
# Procesar los datos del archivo JSON
for game in steam_games:
    game_id.append(game['id'])
    price.append(game['price'])
    developer.append(game['developer'])
    publisher.append(game['publisher'])
    genres.append(game['genres'])
    app_name.append(game['app_name'])
    release_date.append(game['release_date'])
    metascore.append(game['metascore'])
    early_access.append(game['early_access'])
    reviews_url.append(game['reviews_url'])
    discount_price.append(game['discount_price'])
    tags.append(game['tags'])
    title.append(game['title'])

# Crear un DataFrame
games= pd.DataFrame({
    'item_id': game_id,
    'price': price,
    'developer': developer,
    'publisher': publisher,
    'genres': genres,
    'app_name': app_name,
    'release_date': release_date,
    'metascore': metascore,
    'early_access': early_access,
    'reviews_url': reviews_url,
    'discount_price': discount_price,
    'tags': tags,
    'title': title
})



#steam_games
```

Reviews

```
user_id , user_url, item_id, review, posted, recommend, review = [], [], [], [], [], [], []

for user in users_reviews:
    uid = user["user_id"]
    url = user["user_url"]
    for item in user["reviews"]:
      user_id.append(uid)
      user_url.append(url)
      item_id.append(item["item_id"])
      posted.append(item["recommend"])
      recommend.append(item["recommend"])
      review.append(item["review"])



reviews = pd.DataFrame({
  'user_id' : user_id,
  'user_url': user_url,
  'item_id': item_id,
  'posted': posted,
  'recommend': recommend,
  'review': review
})


#steam_reviews
```

Items

```
user_id, user_url, item_id, item_name, playtime_forever, playtime_2weeks = [],[],[],[],[],[]

for items in users_items:
  uid = items["user_id"]
```

```
    url= items["user_url"]
    for item in items['items']:
      user_id.append(uid)
      user_url.append(url)
      item_id.append(item["item_id"])
      item_name.append(item["item_name"])
      playtime_forever.append(item["playtime_forever"])
      playtime_2weeks.append(item["playtime_2weeks"])


items = pd.DataFrame({
  'user_id' : user_id,
  'user_url' : user_url,
  'item_id' : item_id,
  'item_name' : item_name,
  'playtime_forever' : playtime_forever,
  'playtime_2weeks' : playtime_2weeks,
})

#steam_items
```

2 EDA: Explorando los datos

Eplorando

Ver games

```
#games.head()
# books
games.tail()
```

	item_id	price	developer	publisher	genres	app_name	release_date	metascore	early_access	
120440	773640	1.99	Nikita "Ghost_RUS"	Ghost_RUS Games	[Casual, Indie, Simulation, Strategy]	Colony On Mars	2018-01-04	NaN	False	http://steamcommunity.cor
120441	733530	4.99	Sacada	Sacada	[Casual, Indie, Strategy]	LOGistICAL: South Africa	2018-01-04	NaN	False	http://steamcommunity.cor
120442	610660	1.99	Laush Dmitriy Sergeevich	Laush Studio	[Indie, Racing, Simulation]	Russian Roads	2018-01-04	NaN	False	http://steamcommunity.cor
120443	658870	4.99	xropi,stev3ns	SIXNAILS	[Casual, Indie]	EXIT 2 - Directions	2017-09-02	NaN	False	http://steamcommunity.cor

Ver reviews

```
reviews.head()
```

	user_id	user_url	item_id	posted	recommend	review
0	76561197970982479	http://steamcommunity.com/profiles/76561197970...	1250	True	True	Simple yet with great replayability. In my opi...
1	76561197970982479	http://steamcommunity.com/profiles/76561197970...	22200	True	True	It's unique and worth a playthrough.
2	76561197970982479	http://steamcommunity.com/profiles/76561197970...	43110	True	True	Great atmosphere. The gunplay can be a bit chu...
3	js41637	http://steamcommunity.com/id/js41637	251610	True	True	I know what you think when you see this title ...

Ver Items

```
# ver items
items.head()
```

	user_id	user_url	item_id	item_name	playtime_forever	playtime_2weeks
0	76561197970982479	http://steamcommunity.com/profiles/76561197970...	10	Counter-Strike	6	0
1	76561197970982479	http://steamcommunity.com/profiles/76561197970...	20	Team Fortress Classic	0	0
2	76561197970982479	http://steamcommunity.com/profiles/76561197970...	30	Day of Defeat	7	0
3	76561197970982479	http://steamcommunity.com/profiles/76561197970...	40	Deathmatch Classic	0	0
4	76561197970982479	http://steamcommunity.com/profiles/76561197970...	50	Half-Life: Opposing Force	0	0

EDA: Obtener informacion sobre las columnas

```
games.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 120445 entries, 0 to 120444
Data columns (total 13 columns):
 #   Column          Non-Null Count  Dtype
---  ------          --------------  -----
 0   item_id         32133 non-null  object
 1   price           30758 non-null  object
 2   developer       28836 non-null  object
 3   publisher       24083 non-null  object
 4   genres          28852 non-null  object
 5   app_name        32133 non-null  object
 6   release_date    30068 non-null  object
 7   metascore       2677 non-null   object
 8   early_access    32135 non-null  object
 9   reviews_url     32133 non-null  object
 10  discount_price  225 non-null    float64
 11  tags            31972 non-null  object
 12  title           30085 non-null  object
dtypes: float64(1), object(12)
memory usage: 11.9+ MB
```

```
reviews.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 59305 entries, 0 to 59304
Data columns (total 6 columns):
 #   Column     Non-Null Count  Dtype
---  ------     --------------  -----
 0   user_id    59305 non-null  object
 1   user_url   59305 non-null  object
 2   item_id    59305 non-null  object
 3   posted     59305 non-null  bool
 4   recommend  59305 non-null  bool
 5   review     59305 non-null  object
dtypes: bool(2), object(4)
memory usage: 1.9+ MB
```

```
items.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 5153209 entries, 0 to 5153208
Data columns (total 6 columns):
 #   Column            Dtype
---  ------            -----
 0   user_id           object
 1   user_url          object
 2   item_id           object
 3   item_name         object
 4   playtime_forever  int64
 5   playtime_2weeks   int64
dtypes: int64(2), object(4)
memory usage: 235.9+ MB
```

Resumen estadistico de los datos numericos

```
games.describe()
```

	price	metascore	discount_price
count	30758.000000	30758.000000	160.000000
mean	8.866855	6.074420	4.166187
std	15.903457	20.299893	5.101357
min	0.000000	0.000000	0.490000
25%	2.990000	0.000000	0.727500
50%	4.990000	0.000000	2.140000
75%	9.990000	0.000000	5.277500
max	995.000000	96.000000	31.490000

```
reviews.describe()
```

	user_id	user_url	item_id	posted	recommend	review
count	59305	59305	59305	59305	59305	59305
unique	25458	25458	3682	2	2	55313
top	76561198094665607	http://steamcommunity.com/profiles/76561198094...	730	True	True	good game
freq	20	20	3759	52473	52473	100

```
items.describe()
```

	playtime_forever	playtime_2weeks
count	5.153209e+06	5.153209e+06
mean	9.914951e+02	9.104707e+00
std	5.418204e+03	1.403926e+02
min	0.000000e+00	0.000000e+00
25%	0.000000e+00	0.000000e+00
50%	3.400000e+01	0.000000e+00
75%	3.550000e+02	0.000000e+00
max	6.427730e+05	1.996700e+04

Datos faltantes

```
games.isnull().sum()
```

```
item_id            88312
price              89687
developer          91609
publisher          96362
genres             91593
app_name           88312
release_date       90377
metascore         117768
early_access       88310
reviews_url        88312
discount_price    120220
tags               88473
title              90360
dtype: int64
```

```
reviews.isnull().sum()
```

```
user_id      0
user_url     0
item_id      0
posted       0
recommend    0
```

```
review       0
dtype: int64
```

```
items.isnull().sum()
```

```
user_id             0
user_url            0
item_id             0
item_name           0
playtime_forever    0
playtime_2weeks     0
dtype: int64
```

2.2 Limpiando data para la visualizacion

```
games_v = games.copy()

games_v['metascore'].fillna(0, inplace=True)
games_v.dropna(subset=['price'], inplace=True)
```

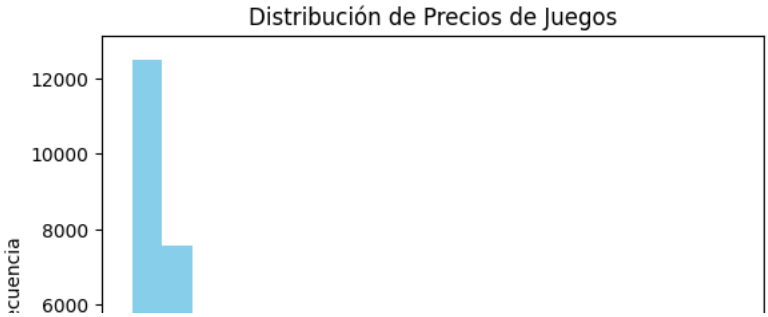
```
# Convierte la columna 'price' a tipo float y los valores no numéricos a 0
games_v['price'] = pd.to_numeric(games_v['price'], errors='coerce').fillna(0)
games_v['metascore'] = pd.to_numeric(games_v['metascore'], errors='coerce').fillna(0)
```

```
games_v.dropna(subset=['item_id'], inplace=True)
games_v['genres'].fillna(0, inplace=True)
games_v.head()
```

	item_id	price	developer	publisher	genres	app_name	release_date	metascore	early_access	
88310	761140	4.99	Kotoshiro	Kotoshiro	[Action, Casual, Indie, Simulation, Strategy]	Lost Summoner Kitty	2018-01-04	0.0	False	http://s
88311	643980	0.00	Secret Level SRL	Making Fun, Inc.	[Free to Play, Indie, RPG, Strategy]	Ironbound	2018-01-04	0.0	False	http://s
88312	670290	0.00	Poolians.com	Poolians.com	[Casual, Free to Play, Indie, Simulation, Sports]	Real Pool 3D - Poolians	2017-07-24	0.0	False	http://s
88313	767400	0.99	彼岸领域	彼岸领域	[Action, Adventure, Casual]	弹炸人2222	2017-12-07	0.0	False	http://s
88314	773570	2.99	NaN	NaN	0	Log Challenge	NaN	0.0	False	http://s

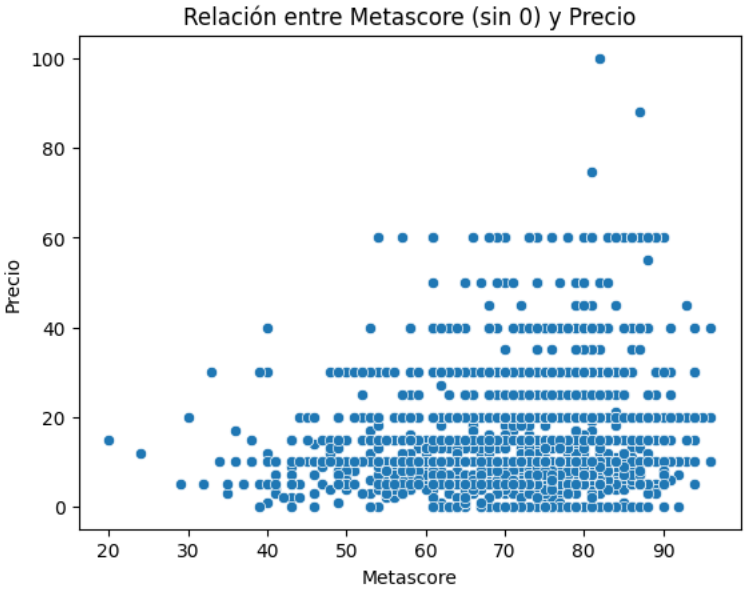
Visualizacion de datos

```
# Ejemplo de histograma de precios en el conjunto de juegos
plt.hist(games_v['price'], bins=20, range=(0,80), color='skyblue')
plt.xlabel('Precio')
plt.ylabel('Frecuencia')
plt.title('Distribución de Precios de Juegos')
plt.show()
```




```
# Filtrar juegos con metascore distinto de 0
games_filtered = games_v[games_v['metascore'] != 0]

# Crear el diagrama de dispersión entre metascore y precio
sns.scatterplot(x='metascore', y='price', data=games_filtered)
plt.xlabel('Metascore')
plt.ylabel('Precio')
plt.title('Relación entre Metascore (sin 0) y Precio')
plt.show()
```



Sistema de recomendacion : usuario-usuario

Convertir reivew sentiment_analisys

```
# nltk
nltk.download('vader_lexicon')

sid = SentimentIntensityAnalyzer()
#resultados = sid.polarity_scores()


def map_to_custom_scale(sentiment_score):
    if sentiment_score < 0:
        return 0  # Malo
    elif sentiment_score == 0:
        return 1  # Neutral
    else:
        return 2  # Positivo}

reviews["sentiment_analysis"] = reviews["review"].apply(lambda i: map_to_custom_scale( sid.polarity_scores(i)['compound']))
```

```
[nltk_data] Downloading package vader_lexicon to /root/nltk_data...
```

	user_id	user_url	item_id	posted	recommend	review
0	76561197970982479	http://steamcommunity.com/profiles/76561197970...	1250	True	True	Simple yet with great replayability. In my opi...
1	76561197970982479	http://steamcommunity.com/profiles/76561197970...	22200	True	True	It's unique and worth a playthrough.
2	76561197970982479	http://steamcommunity.com/profiles/76561197970...	43110	True	True	Great atmosphere. The gunplay can be a bit chu...
3	js41637	http://steamcommunity.com/id/js41637	251610	True	True	I know what you think when you see this title ...
4	js41637	http://steamcommunity.com/id/js41637	227300	True	True	For a simple (it's actually not all that simpl...

Crear tabla de usuarios

```
# de items -> users
users = items.drop_duplicates(subset='user_id')
users.drop("item_id", axis=1, inplace=True)
users.head()
```

```
<ipython-input-20-529287963a1d>:3: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view
  users.drop("item_id", axis=1, inplace=True)
```

	user_id	user_url	item_name	playtime_forever	playtime_2weeks
0	76561197970982479	http://steamcommunity.com/profiles/76561197970...	Counter-Strike	6	0
277	js41637	http://steamcommunity.com/id/js41637	Counter-Strike	0	0
1165	evcentric	http://steamcommunity.com/id/evcentric	Red Orchestra: Ostfront 41-45	923	0
1302	Riot-Punch	http://steamcommunity.com/id/Riot-Punch	Counter-Strike	0	0
1630	doctr	http://steamcommunity.com/id/doctr	Day of Defeat: Source	1131	0

Merge

```
df1 = users.merge(reviews, on="user_id")
```

```
df1.isnull().sum()
```

```
user_id              0
user_url_x           0
item_name            0
playtime_forever     0
playtime_2weeks      0
user_url_y           0
item_id              0
posted               0
recommend            0
review               0
sentiment_analysis   0
dtype: int64
```

```
df1.head()
```

	user_id	user_url_x	item_name	playtime_forever	playtime_2weeks	

```
# limpiar games
gamess = games.drop(columns=['price', 'developer', 'publisher', 'app_name', 'release_date', 'metascore', 'early_access', 'reviev

gamess = gamess.dropna()
gamess.shape
```

```
(28824, 3)
```

```
gamess.tail()
```

	item_id	genres	title
120439	745400	[Action, Adventure, Casual, Indie]	Kebab it Up!
120440	773640	[Casual, Indie, Simulation, Strategy]	Colony On Mars
120441	733530	[Casual, Indie, Strategy]	LOGistICAL: South Africa
120442	610660	[Indie, Racing, Simulation]	Russian Roads
120443	658870	[Casual, Indie]	EXIT 2 - Directions

```
data = df1.merge(gamess[['item_id', 'title', 'genres']], on='item_id', how='left')
data.head()
```

	user_id	user_url_x	item_name	playtime_forever	playtime_2weeks	
0	76561197970982479	http://steamcommunity.com/profiles/76561197970...	Counter-Strike	6	0	http://steamcommunity.cor
1	76561197970982479	http://steamcommunity.com/profiles/76561197970...	Counter-Strike	6	0	http://steamcommunity.cor
2	76561197970982479	http://steamcommunity.com/profiles/76561197970...	Counter-Strike	6	0	http://steamcommunity.cor
3	js41637	http://steamcommunity.com/id/js41637	Counter-Strike	0	0	http://steamc
4	js41637	http://steamcommunity.com/id/js41637	Counter-Strike	0	0	http://steamc

Creamos users_pivot

```
# creamos una copia
df=data.copy()

df.drop(columns=['user_url_x', 'item_name', 'playtime_forever', 'playtime_2weeks', 'user_url_y', 'posted', 'recommend', 'review

df.dropna(inplace=True)
import re  # Import the re module for regular expressions
df["title"] = df["title"].apply(lambda x: re.sub("[\W_]+", " ", x).strip())
df.reset_index(drop=True,inplace=True)
df["item_id"] = df["item_id"].astype(int)


df
```

	user_id	item_id	sentiment_analysis	title
0	76561197970982479	1250	2	Killing Floor
1	76561197970982479	22200	2	Zeno Clash
2	js41637	227300	2	Euro Truck Simulator 2
3	js41637	239030	2	Papers Please
4	evcentric	248820	2	Risk of Rain
...	...	...	...	...
44669	Ghoustik	730	1	Counter Strike Global Offensive
44670	76561198312638244	233270	2	Far Cry 3 Blood Dragon
44671	76561198312638244	130	2	Half Life Blue Shift
44672	76561198312638244	70	2	Half Life
44673	76561198312638244	362890	2	Black Mesa

```
users_pivot=df.pivot_table(index=["user_id"],columns=["title"],values="sentiment_analysis")
users_pivot.fillna(0,inplace=True)

users_pivot = users_pivot.astype(int)
#users_pivot.columns
print(users_pivot.shape)
```

```
(20624, 2871)
```

```
users_pivot
```

user_id	title	10 000 000	100 Orange Juice	100 Orange Juice Krila amp Kae Character Pack	12 Labours of Hercules	12 Labours of Hercules II The Cretan Bull	140	16bit Trader	18 Wheels of Steel Extreme Trucker	1943 Megami Strike	200 Mixed Juice	...	nail d	oO	plar the of a
--000--		0	0	0	0	0	0	0	0	0	0	...	0	0	
--ace--		0	0	0	0	0	0	0	0	0	0	...	0	0	
--ionex--		0	0	0	0	0	0	0	0	0	0	...	0	0	
-2SV-vuLB-Kg		0	0	0	0	0	0	0	0	0	0	...	0	0	
-Azsael-		0	0	0	0	0	0	0	0	0	0	...	0	0	
...		...	...	...	...	...	...	...	...	...	...	...	...	...	
zvanik		0	0	0	0	0	0	0	0	0	0	...	0	0	
zwanzigdrei		0	0	0	0	0	0	0	0	0	0	...	0	0	
zy0705		0	0	0	0	0	0	0	0	0	0	...	0	0	
zynxgameth		0	0	0	0	0	0	0	0	0	0	...	0	0	
zyr0n1c		0	0	0	0	0	0	0	0	0	0	...	0	0	

20624 rows × 2871 columns

basado en contenido

```
# sistema de recomendacion basado user-user similaridad de coseno de sentiment_analisis

import pandas as pd
from sklearn.metrics.pairwise import cosine_similarity


# Función para recomendar elementos a un usuario
def recomendacion_usuario(user_id, users_pivot):
    usuario_objetivo = users_pivot.loc[user_id]
```

```
    similarities = cosine_similarity([usuario_objetivo], users_pivot )

    usuario_similar = similarities[0]

    user_index = users_pivot.index.get_loc(user_id)

    usuario_similar[user_index] = -1  # Excluir al propio usuari
    mejores_usuarios = usuario_similar.argsort()[::-1]

    elementos_vistos = usuario_objetivo[usuario_objetivo > 0].index


    recomendaciones = []
    for usuario_sim in mejores_usuarios:
        elementos_recomendados = users_pivot.iloc[usuario_sim]
        elementos_recomendados = elementos_recomendados[elementos_recomendados > 0].index
        elementos_recomendados = [e for e in elementos_recomendados if e not in elementos_vistos]
        recomendaciones.extend(elementos_recomendados)
        if len(recomendaciones) >= 5:
            break

    return recomendaciones[:5]  # Limitar a 5 recomendaciones

usuario_objetivo = '--ace--'
recomendaciones = recomendacion_usuario(usuario_objetivo, users_pivot)

print(f"Recomendaciones para {usuario_objetivo}:")
for i, elemento in enumerate(recomendaciones, 1):
    print(f"{i}. {elemento}")


  --NORMAL--
```

```
Recomendaciones para --ace--:
1. Battlefield Bad Company 2
2. Zeno Clash
3. Starbound
4. Borderlands 2
5. The Walking Dead
```