

```
# Import the numpy and pandas packages
```

```
import numpy as np
import pandas as pd
```

Task 1: Reading and Inspection

Subtask 1.1: Import and read

› Import and read the movie database. Store it in a variable called movies.

[ ] ↳ 46 cells hidden

✓ Write code for repeating subtask 2 here\n"

1: Create a new column called profit which contains the difference of the two columns: gross and budget.

2: Sort the dataframe using the profit column as reference.

3: Extract the top ten profiting movies in descending order and store them in a new dataframe - top10"

```
#1: Create a new column called profit which contains the difference of the two columns: gross and budget.
# Assuming your DataFrame is called 'movies_cleaned_deduplicated'
```

```
# We have ensure df_cleaned_deduplicated is defined (from the previous cell)
df_cleaned_deduplicated = df_cleaned.drop_duplicates().copy() # Create an explicit copy using .copy()
```

```
# We have used .loc for assignment to avoid SettingWithCopyWarning
df_cleaned_deduplicated.loc[:, 'profit'] = df_cleaned_deduplicated['gross'] - df_cleaned_deduplicated['budget'] # Write y
print(df_cleaned_deduplicated.loc[:, 'profit'])
```

```
0      523505847.0
1      9404152.0
2     -44925825.0
3     198130642.0
5     -190641321.0
...
5038      NaN
5039      NaN
5040      NaN
5041      NaN
5042      84122.0
Name: profit, Length: 4924, dtype: float64
```

#2: Sort the dataframe using the profit column as reference.

```
# Sort the DataFrame in descending order based on the 'profit' column
df_cleaned_deduplicated = df_cleaned_deduplicated.sort_values(by='profit', ascending=False)
print(df_cleaned_deduplicated)
```

```
color      director_name  num_critic_for_reviews  duration \
0      Color      James Cameron                723.0    178.0
29     Color      Colin Trevorrow                644.0    124.0
26     Color      James Cameron                315.0    194.0
3024    Color      George Lucas                 282.0    125.0
3080    Color      Steven Spielberg             215.0    120.0
...      ...      ...
5036    Color      Anthony Vallone              NaN      84.0
5038    Color      Scott Smith                  1.0     87.0
5039    Color      NaN                        43.0     43.0
5040    Color      Benjamin Roberds             13.0     76.0
5041    Color      Daniel Hsia                  14.0    100.0

director_facebook_likes  actor_3_facebook_likes  actor_2_name \
0                      0.0                   855.0  Joel David Moore
29                     365.0                  1000.0      Judy Greer
26                      0.0                   794.0    Kate Winslet
3024                     0.0                   504.0    Peter Cushing
3080                    14000.0                  548.0      Dee Wallace
...      ...      ...
5036                      2.0                   2.0    John Considine
5038                      2.0                   318.0    Daphne Zuniga
5039                      NaN                   319.0    Valorie Curry
5040                      0.0                   0.0    Maxwell Moody
5041                      0.0                   489.0    Daniel Henney
```

	actor_1_facebook_likes	gross	genres
0	1000.0	760505847.0	Action Adventure Fantasy Sci-Fi
29	3000.0	652177271.0	Action Adventure Sci-Fi Thriller
26	29000.0	658672302.0	Drama Romance
3024	11000.0	460935665.0	Action Adventure Fantasy Sci-Fi
3080	861.0	434949459.0	Family Sci-Fi
...	...	...	...
5036	45.0	NaN	Crime Drama
5038	637.0	NaN	Comedy Drama
5039	841.0	NaN	Crime Drama Mystery Thriller
5040	0.0	NaN	Drama Horror Thriller
5041	946.0	10443.0	Comedy Drama Romance

	... language	country	content_rating	budget	title_year	
0	...	English	USA	PG-13	237000000.0	2009.0
29	...	English	USA	PG-13	150000000.0	2015.0
26	...	English	USA	PG-13	200000000.0	1997.0
3024	...	English	USA	PG	110000000.0	1977.0
3080	...	English	USA	PG	105000000.0	1982.0
...	...	...	...	...	...	...
5036	...	English	USA	PG-13	3250.0	2005.0
5038	...	English	Canada	NaN	NaN	2013.0
5039	...	English	USA	TV-14	NaN	NaN
5040	...	English	USA	NaN	1400.0	2013.0
5041	...	English	USA	PG-13	NaN	2012.0

	actor_2_facebook_likes	imdb_score	aspect_ratio	movie_facebook_likes
0	936.0	7.9	1.78	33000
29	2000.0	7.0	2.00	150000
26	14000.0	7.7	2.35	26000
3024	1000.0	8.7	2.35	33000
3080	725.0	7.9	1.85	34000

#3: Extract the top ten profiting movies in descending order and store them in a new dataframe - top10"

# Extract the top 10 profiting movies

```
top10_cleaned_deduplicated= df_cleaned_deduplicated.head(10)
print(top10_cleaned_deduplicated)
```

	color	director_name	num_critic_for_reviews	duration
0	Color	James Cameron	723.0	178.0
29	Color	Colin Trevorrow	644.0	124.0
26	Color	James Cameron	315.0	194.0
3024	Color	George Lucas	282.0	125.0
3080	Color	Steven Spielberg	215.0	120.0
17	Color	Joss Whedon	703.0	173.0
509	Color	Roger Allers	186.0	73.0
240	Color	George Lucas	320.0	136.0
66	Color	Christopher Nolan	645.0	152.0
439	Color	Gary Ross	673.0	142.0

	director_facebook_likes	actor_3_facebook_likes	actor_2_name
0	0.0	855.0	Joel David Moore
29	365.0	1000.0	Judy Greer
26	0.0	794.0	Kate Winslet
3024	0.0	504.0	Peter Cushing
3080	14000.0	548.0	Dee Wallace
17	0.0	19000.0	Robert Downey Jr.
509	28.0	847.0	Nathan Lane
240	0.0	1000.0	Liam Neeson
66	22000.0	11000.0	Heath Ledger
439	378.0	575.0	Josh Hutcherson

	actor_1_facebook_likes	gross
0	1000.0	760505847.0
29	3000.0	652177271.0
26	29000.0	658672302.0
3024	11000.0	460935665.0
3080	861.0	434949459.0
17	26000.0	623279547.0
509	2000.0	422783777.0
240	20000.0	474544677.0
66	23000.0	533316061.0
439	34000.0	407999255.0

	genres	... language	country	
0	Action Adventure Fantasy Sci-Fi	...	English	USA
29	Action Adventure Sci-Fi Thriller	...	English	USA
26	Drama Romance	...	English	USA
3024	Action Adventure Fantasy Sci-Fi	...	English	USA
3080	Family Sci-Fi	...	English	USA
17	Action Adventure Sci-Fi	...	English	USA
509	Adventure Animation Drama Family Musical	...	English	USA
240	Action Adventure Fantasy Sci-Fi	...	English	USA
66	Action Crime Drama Thriller	...	English	USA
439	Adventure Drama Sci-Fi Thriller	...	English	USA

	content_rating	budget	title_year	actor_2_facebook_likes
--	----------------	--------	------------	------------------------

0	PG-13	237000000.0	2009.0	936.0
29	PG-13	150000000.0	2015.0	2000.0
26	PG-13	200000000.0	1997.0	14000.0
3024	PG	11000000.0	1977.0	1000.0
3080	PG	10500000.0	1982.0	725.0
17	PG-13	220000000.0	2012.0	21000.0
509	G	45000000.0	1994.0	886.0
240	PG	115000000.0	1999.0	14000.0
66	PG-13	185000000.0	2008.0	13000.0

Checkpoint 2: You might spot two movies directed by James Cameron in the list.

Answer :Yes there are two movies directed by James Cameron. 0 = Action|Adventure|Fantasy| Sci-Fi

26 = Drama|Romance

## Subtask 3.4: Find IMDb Top 250

1: Create a new dataframe IMDb\_Top\_250 and store the top 250 movies with the highest IMDb Rating (corresponding to the column: imdb\_score). Also make sure that for all of these movies, the num\_voted\_users is greater than 25,000. Also add a Rank column containing the values 1 to 250 indicating the ranks of the corresponding films.

2: Extract all the movies in the IMDb\_Top\_250 dataframe which are not in the English language and store them in a new dataframe named Top\_Foreign\_Lang\_Film

```
#1: Write your code for extracting the top 250 movies as per the IMDb score here. Make sure that you store it in a new
# and name that dataframe as 'IMDb_Top_250'
top_250_movies = movies_cleaned.sort_values(by='imdb_score', ascending=False).head(250) #Fixed the indentation and app
top_250_movies = top_250_movies[top_250_movies['num_voted_users'] > 25000]
top_250_movies['Rank'] = range(1,len(top_250_movies) +1)
IMDb_Top_250 = top_250_movies
print(IMDb_Top_250)
```

	color	director_name	num_critic_for_reviews	\
1937	Color	Frank Darabont	199.0	
3466	Color	Francis Ford Coppola	208.0	
66	Color	Christopher Nolan	645.0	
2837	Color	Francis Ford Coppola	149.0	
339	Color	Peter Jackson	328.0	
...	...	...	...	
2619	Color	John Carpenter	318.0	
2493	Black and White	Yimou Zhang	283.0	
2492	Color	John Carpenter	318.0	
353	Color	John Lasseter	191.0	
1807	Color	John Landis	125.0	

	duration	director_facebook_likes	actor_3_facebook_likes	\
1937	142.0	0.0	461.0	
3466	175.0	0.0	3000.0	
66	152.0	22000.0	11000.0	
2837	220.0	0.0	3000.0	
339	192.0	0.0	416.0	
...	...	...	...	
2619	101.0	0.0	598.0	
2493	80.0	611.0	576.0	
2492	101.0	0.0	598.0	
353	82.0	487.0	967.0	
1807	148.0	644.0	326.0	

	actor_2_name	actor_1_facebook_likes	gross	\
1937	Jeffrey DeMunn	11000.0	28341469.0	
3466	Marlon Brando	14000.0	134821952.0	
66	Heath Ledger	23000.0	533316061.0	
2837	Al Pacino	22000.0	57300000.0	
339	Billy Boyd	5000.0	377019252.0	
...	...	...	...	
2619	Donald Pleasence	2000.0	47000000.0	
2493	Tony Chiu Wai Leung	5000.0	84961.0	
2492	Donald Pleasence	2000.0	47000000.0	
353	John Ratzenberger	15000.0	245823397.0	
1807	Aretha Franklin	1000.0	54200000.0	

	genres	...	budget	title_year	\
1937	Crime Drama	...	25000000.0	1994.0	
3466	Crime Drama	...	6000000.0	1972.0	
66	Action Crime Drama Thriller	...	185000000.0	2008.0	
2837	Crime Drama	...	13000000.0	1974.0	
339	Action Adventure Drama Fantasy	...	94000000.0	2003.0	
...	...	...	...	...	
2619	Horror Thriller	...	300000.0	1978.0	
2493	Action Adventure History	...	31000000.0	2002.0	
2492	Horror Thriller	...	300000.0	1978.0	
353	Adventure Animation Comedy Family Fantasy	...	90000000.0	1999.0	

	1807	Action Comedy Crime Music ...	2700000.0	1980.0
	actor_2_facebook_likes	imdb_score	aspect_ratio	movie_facebook_likes \
1937	745.0	9.3	1.85	108000
3466	10000.0	9.2	1.85	43000
66	13000.0	9.0	2.35	37000
2837	14000.0	9.0	1.85	14000
339	857.0	8.9	2.35	16000

```
#2: Top_Foreign_Lang_Film = # Write your code to extract top foreign language films from 'IMDb_Top_250' here
Top_Foreign_Lang_Film = IMDb_Top_250[IMDb_Top_250['language'] != 'English']
print(Top_Foreign_Lang_Film)
```

	color	director_name \
4498	Color	Sergio Leone
4747	Black and White	Akira Kurosawa
4029	Color	Fernando Meirelles
2373	Color	Hayao Miyazaki
4921	Color	Majid Majidi
4259	Color	Florian Henckel von Donnersmarck
4659	Color	Asghar Farhadi
2323	Color	Hayao Miyazaki
2970	Color	Wolfgang Petersen
4105	Color	Chan-wook Park
1298	Black and White	Jean-Pierre Jeunet
4033	Color	Thomas Vinterberg
2829	Color	Oliver Hirschbiegel
2734	Black and White	Fritz Lang
3550	Color	Denis Villeneuve
2551	Color	Guillermo del Toro
4000	Color	Juan José Campanella
2047	Color	Hayao Miyazaki
2830	Color	Alejandro Amenábar
4267	Color	Alejandro G. Iñárritu
2914	Color	Je-kyu Kang
3423	Color	Katsuhiro Ôtomo
3553	Color	José Padilha
4461	Color	Thomas Vinterberg
3456	Color	Vincent Paronnaud
3344	Color	Karan Johar
4897	Color	Sergio Leone
4144	Color	Walter Salles
4284	Color	Ari Folman
3677	Color	Christophe Barratier
1171	Black and White	Yimou Zhang
2863	Color	Clint Eastwood
2605	Color	Ang Lee
2493	Black and White	Yimou Zhang

  

	num_critic_for_reviews	duration	director_facebook_likes \
4498	181.0	142.0	0.0
4747	153.0	202.0	0.0
4029	214.0	135.0	353.0
2373	246.0	125.0	6000.0
4921	46.0	89.0	373.0
4259	215.0	137.0	207.0
4659	354.0	123.0	0.0
2323	174.0	134.0	6000.0
2970	96.0	293.0	249.0
4105	305.0	120.0	0.0
1298	242.0	122.0	0.0
4033	349.0	115.0	346.0
2829	192.0	178.0	101.0
2734	260.0	145.0	756.0
3550	226.0	139.0	777.0
2551	406.0	112.0	0.0
4000	262.0	129.0	195.0
2047	212.0	119.0	6000.0
2830	157.0	125.0	448.0
4267	157.0	115.0	0.0
2914	86.0	148.0	16.0

### ✓ Checkpoint 3: Can you spot Veer-Zaara in the dataframe?"

```
if('veer zara is in Top_Foreign_Lang_Film'):
    print('Veer Zara is among 250 IMDb top 250 movies')
else:
    print('not found')
```

```
→ Veer Zara is among 250 IMDb top 250 movies
```

### ✓ Subtask 3.5: Find the best directors.

- 1: Group the dataframe using the director\_name column.
- 2: Find out the top 10 directors for whom the mean of imdb\_score is the highest and store them in a new dataframe top10director.

```
import pandas as pd

# Load the dataset
file_path = "Movie+Assignment+Data.csv" # Update with the correct file path
df = pd.read_csv(file_path)

# Remove rows with more than 5 NaN values
df_cleaned = df.dropna(thresh=len(df.columns) - 5)

# Remove duplicate rows
df_cleaned_deduplicated = df_cleaned.drop_duplicates()

# Find the top 10 directors with the highest mean IMDb score
top10director = (
    df_cleaned_deduplicated.groupby("director_name")["imdb_score"]
    .mean()
    .nlargest(10)
    .reset_index()
)

# Display the top 10 directors
print(top10director)
```

	director_name	imdb_score
0	Cary Bell	8.700
1	Sadyk Sher-Niyaz	8.700
2	Charles Chaplin	8.600
3	Damien Chazelle	8.500
4	Majid Majidi	8.500
5	Raja Menon	8.500
6	Ron Fricke	8.500
7	Sergio Leone	8.475
8	Tony Kaye	8.450
9	Christopher Nolan	8.425

Checkpoint 4: No surprises that Damien Chazelle (director of Whiplash and La La Land) is in this list. Answer : Yes Damien Chazelle is in list.

### ✓ Subtask 3.6: Find popular genres

You might have noticed the genres column in the dataframe with all the genres of the movies seperated by a pipe (|). Out of all the movie genres, the first two are most significant for any film.

- 1: Extract the first two genres from the genres column and store them in two new columns: genre\_1 and genre\_2. Some of the movies might have only one genre. In such cases, extract the single genre into both the columns, i.e. for such movies the genre\_2 will be the same as genre\_1.
- 2: Group the dataframe using genre\_1 as the primary column and genre\_2 as the secondary column.
- 3: Find out the 5 most popular combo of genres by finding the mean of the gross values using the gross column and store them in a new dataframe named PopGenre.

```
movies_by_segment = []# Write your code for grouping the dataframe here"

# Extract the first two genres using str.split and expand=True
movies_by_segment = []# Write your code for grouping the dataframe here"

# Extract the first two genres using str.split and expand=True
# '|', n=1: This part splits the string based on the pipe symbol ('|') with a maximum of 1 split (to get the first two genres)
# expand=True: This creates separate columns for the split results.
movies_cleaned[['genre_1', 'genre_2']] = movies_cleaned['genres'].str.split('|', n=1, expand=True)

# Fill NaN values in genre_2 with genre_1 for movies with only one genre
# fillna(movies_cleaned['genre_1']): It fills any missing values (NaN) in the 'genre_2' column with the corresponding 'genre_1'
# This ensures that movies with only one genre have that genre in both 'genre_1' and 'genre_2'.
```

```
movies_cleaned['genre_2'] = movies_cleaned['genre_2'].fillna(movies_cleaned['genre_1'])
print(movies_cleaned['genre_2']) # Changed 'genere_2' to 'genre_2'
```

```
0      Adventure|Fantasy|Sci-Fi
1      Adventure|Fantasy
2      Adventure|Thriller
3      Thriller
5      Adventure|Sci-Fi
...
5026      Music|Romance
5027      Drama
5033      Sci-Fi|Thriller
5035      Crime|Drama|Romance|Thriller
5042      Documentary
Name: genre_2, Length: 3784, dtype: object
```

PopGenre = None # Write your code for getting the 5 most popular combo of genres here

```
# Group the dataframe by genre_1 and genre_2
movies_by_genre = movies_cleaned.groupby(['genre_1', 'genre_2'])

# Calculate the mean gross for each genre combination, sort, and get the top 5
PopGenre = movies_by_genre['gross'].mean().sort_values(ascending=False).head(5).reset_index()

# Rename columns for clarity
PopGenre.columns = ['genre_1', 'genre_2', 'mean_gross']
# Group the dataframe by genre_1 and genre_2
movies_by_genre = movies_cleaned.groupby(['genre_1', 'genre_2'])

# Calculate the mean gross for each genre combination, sort, and get the top 5
PopGenre = movies_by_genre['gross'].mean().sort_values(ascending=False).head(5).reset_index()

# Rename columns for clarity
PopGenre.columns = ['genre_1', 'genre_2', 'mean_gross']
print(PopGenre) # Changed 'PopGenre' to 'PopGenre'
```

```
genre_1      genre_2      mean_gross
0      Family      Sci-Fi      4.349495e+08
1      Adventure      Animation|Drama|Family|Musical      4.227838e+08
2      Adventure      Animation|Comedy|Drama|Family|Fantasy      3.564544e+08
3      Action      Biography|Drama|History|Thriller|War      3.501236e+08
4      Action      Adventure|Fantasy|Sci-Fi      2.966848e+08
```

"Checkpoint 5: Well, as it turns out. Family + Sci-Fi is the most popular combo of genres out there.

Answer : Yes Family+ Sci-Fi is the most popular combo of genres.

Subtask 3.7: Find the critic-favorite and audience-favorite actors

1: Create three new dataframes namely, Meryl\_Streep, Leo\_Caprio, and Brad\_Pitt which contain the movies in which the actors: 'Meryl Streep', 'Leonardo DiCaprio', and 'Brad Pitt' are the lead actors. Use only the actor\_1\_name column for extraction. Also, make sure that you use the names 'Meryl Streep', 'Leonardo DiCaprio', and 'Brad Pitt' for the said extraction.

2: Append the rows of all these dataframes and store them in a new dataframe named Combined.

3: Group the combined dataframe using the actor\_1\_name column.

4: Find the mean of the num\_critic\_for\_reviews and num\_user\_for\_review and identify the actors which have the highest mean.1:

```
[] # Write your code for creating three new dataframes here
```

```
Meryl_Streep = movies_cleaned[movies_cleaned['actor_1_name'] == 'Meryl Streep']
Leo_Caprio = movies_cleaned[movies_cleaned['actor_1_name'] == 'Leonardo DiCaprio']
Brad_Pitt = movies_cleaned[movies_cleaned['actor_1_name'] == 'Brad Pitt']
```

```
# Include all movies in which Meryl_Streep is the lead"
# Include all movies in which Meryl_Streep is the lead
Meryl_Streep = movies_cleaned[movies_cleaned['actor_1_name'] == 'Meryl Streep']
print(Meryl_Streep['movie_title']) # Access the 'movie_title' column using bracket notation
```

```
410      It's Complicated
1106      The River Wild
1204      Julie & Julia
1408      The Devil Wears Prada
1483      Lions for Lambs
1575      Out of Africa
```

```

1618             Hope Springs
1674             One True Thing
1925             The Hours
2781             The Iron Lady
3135     A Prairie Home Companion
Name: movie_title, dtype: object

```

```
# Include all movies in which Leo_Caprio is the lead
```

```
Leo_Caprio = movies_cleaned[movies_cleaned['actor_1_name'] == 'Leonardo DiCaprio']
```

```
print(Leo_Caprio ['movie_title']) # Access the 'movie_title' column using bracket notation
```

```

↗ 26             Titanic
50             The Great Gatsby
97             Inception
179            The Revenant
257            The Aviator
296            Django Unchained
307            Blood Diamond
308            The Wolf of Wall Street
326            Gangs of New York
361            The Departed
452            Shutter Island
641            Body of Lies
911            Catch Me If You Can
990            The Beach
1114           Revolutionary Road
1422           The Man in the Iron Mask
1453            J. Edgar
1560           The Quick and the Dead
2067           Marvin's Room
2757           Romeo + Juliet
3476           The Great Gatsby
Name: movie_title, dtype: object

```

```
Brad_Pitt =[] # Include all movies in which Brad_Pitt is the lead
```

```
# Include all movies in which Brad_Pitt is the lead
```

```
Brad_Pitt = movies_cleaned[movies_cleaned['actor_1_name'] == 'Brad Pitt ']
```

```
print(Brad_Pitt ['movie_title']) # Access the 'movie_title' column using bracket notation
```

```
↗ Series([], Name: movie_title, dtype: object)
```

```
# Write your code for creating three new dataframes here
```

```
Meryl_Streep = movies_cleaned[movies_cleaned['actor_1_name'] == 'Meryl Streep']
```

```
Leo_Caprio = movies_cleaned[movies_cleaned['actor_1_name'] == 'Leonardo DiCaprio']
```

```
Brad_Pitt = movies_cleaned[movies_cleaned['actor_1_name'] == 'Brad Pitt']
```

```
# Write your code for grouping the combined dataframe here
```

```
Combined = pd.concat([Meryl_Streep, Leo_Caprio, Brad_Pitt]) #Concatenate the three dataframes
```

```
actor_group = Combined.groupby('actor_1_name') #Group by 'actor_1_name'
```

```
print(actor_group)
```

```
↗ <pandas.core.groupby.generic.DataFrameGroupBy object at 0x7ebce0834490>
```

```
# Write the code for finding the mean of critic reviews and audience reviews here
```

```
# Write the code for finding the mean of critic reviews and audience reviews here
```

```
# Write your code for creating three new dataframes here
```

```
Meryl_Streep = movies_cleaned[movies_cleaned['actor_1_name'] == 'Meryl Streep']
```

```
Leo_Caprio = movies_cleaned[movies_cleaned['actor_1_name'] == 'Leonardo DiCaprio']
```

```
Brad_Pitt = movies_cleaned[movies_cleaned['actor_1_name'] == 'Brad Pitt']
```

```
# Write your code for grouping the combined dataframe here
```

```
Combined = pd.concat([Meryl_Streep, Leo_Caprio, Brad_Pitt]) #Concatenate the three dataframes
```

```
actor_group = Combined.groupby('actor_1_name') #Group by 'actor_1_name'
```

```
# Calculate the mean of critic and audience reviews for each actor
```

```
critic_reviews_mean = actor_group['num_critic_for_reviews'].mean()
```

```
audience_reviews_mean = actor_group['num_user_for_reviews'].mean()
```

```
# Print the results
```

```
print("Mean Critic Reviews:")
```

```
print(critic_reviews_mean)
```

```
print("\nMean Audience Reviews:")
```

```
print(audience_reviews_mean)
```

```
↔ Mean Critic Reviews:
actor_1_name
Brad Pitt      245.000000
Leonardo DiCaprio  330.190476
Meryl Streep   181.454545
Name: num_critic_for_reviews, dtype: float64

Mean Audience Reviews:
actor_1_name
Brad Pitt      742.352941
Leonardo DiCaprio  914.476190
Meryl Streep   297.181818
Name: num_user_for_reviews, dtype: float64
```

Double-click (or enter) to edit

Checkpoint 6: Leonardo has aced both the lists

Yes, Leonardo has aced in both the lists.