

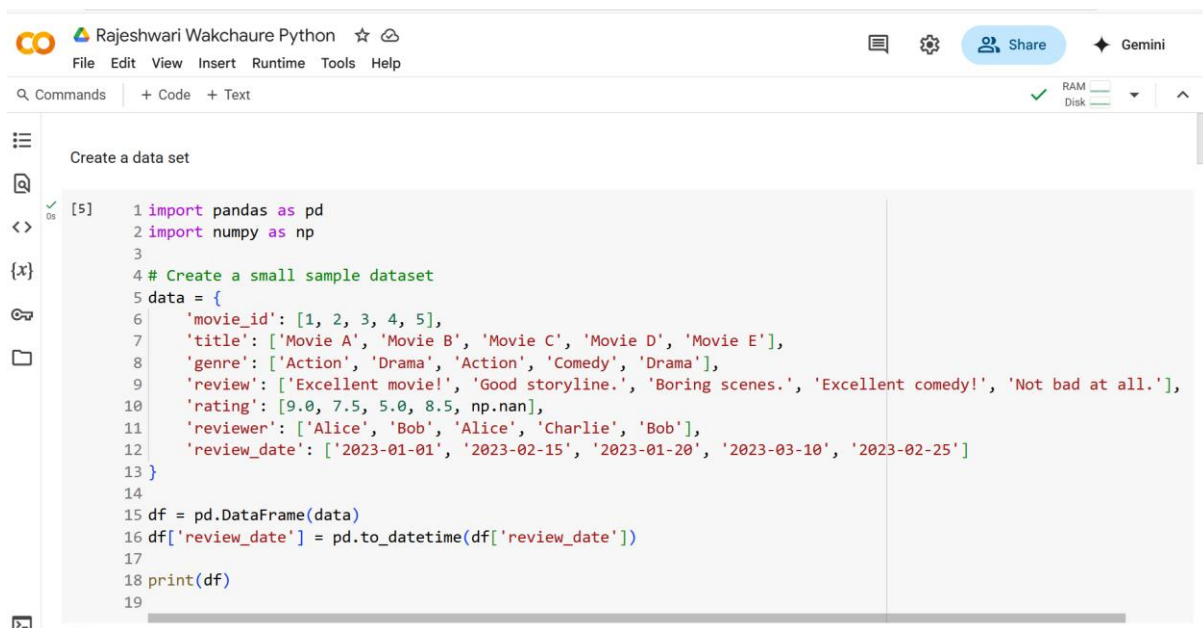
THEORY ACTIVITY NO. 1

NAME: -RAJESHWARI CHANGDEV WAKCHAURE

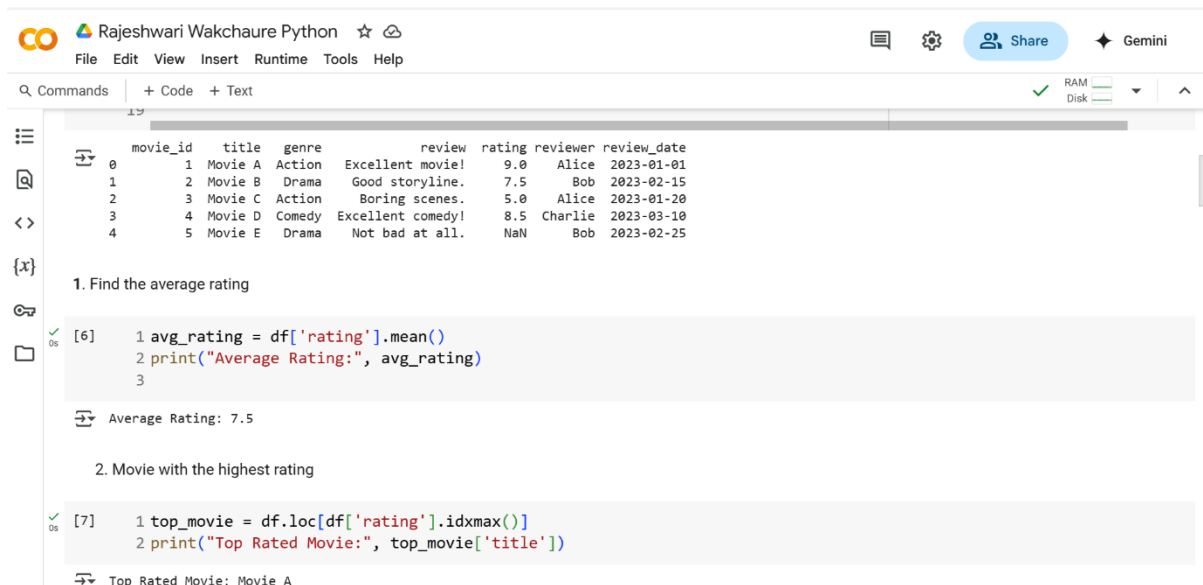
PRN: -202401040271

ROLL NO: -CS3-55


Formulate 20 problem statements for a given dataset using Numpy and Pandas and Apply Numpy and pandas methods to find the solution for the formulated problem statements . Each one will take a real-life dataset.



```
1 import pandas as pd
2 import numpy as np
3
4 # Create a small sample dataset
5 data = {
6     'movie_id': [1, 2, 3, 4, 5],
7     'title': ['Movie A', 'Movie B', 'Movie C', 'Movie D', 'Movie E'],
8     'genre': ['Action', 'Drama', 'Action', 'Comedy', 'Drama'],
9     'review': ['Excellent movie!', 'Good storyline.', 'Boring scenes.', 'Excellent comedy!', 'Not bad at all.'],
10    'rating': [9.0, 7.5, 5.0, 8.5, np.nan],
11    'reviewer': ['Alice', 'Bob', 'Alice', 'Charlie', 'Bob'],
12    'review_date': ['2023-01-01', '2023-02-15', '2023-01-20', '2023-03-10', '2023-02-25']
13 }
14
15 df = pd.DataFrame(data)
16 df['review_date'] = pd.to_datetime(df['review_date'])
17
18 print(df)
19
```



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Top Rated Movie: Movie A

3. Number of reviews per genre

[8]

1 reviews_per_genre = df['genre'].value_counts()
2 print(reviews_per_genre)
3

genre

Action 2
Drama 2
Comedy 1
Name: count, dtype: int64


4. Standard deviation of ratings

[9]

1 rating_std = df['rating'].std()
2 print("Rating Standard Deviation:", rating_std)
3

Rating Standard Deviation: 1.7795130420052185

5. Number of movies with rating > 8



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1 highRatedMovies = (df['rating'] > 8).sum()
2 print("Movies with Rating > 8:", highRatedMovies)
3

Movies with Rating > 8: 2

6. Top 5 genres with most reviews

[11]

1 top_genres = df['genre'].value_counts().head(5)
2 print(top_genres)
3


genre

Action 2
Drama 2
Comedy 1
Name: count, dtype: int64

7. Number of unique reviewers

[12]

1 unique_reviewers = df['reviewer'].nunique()
2 print("Unique Reviewers:", unique_reviewers)
3

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✓ RAM Disk ^

☰

✓ [12] 1 unique_reviewers = df['reviewer'].nunique()
2 print("Unique Reviewers:", unique_reviewers)
3

📄

<> Unique Reviewers: 3

{x}

8. Most frequent reviewer

🔍

✓ [13] 1 top_reviewer = df['reviewer'].value_counts().idxmax()
2 print("Top Reviewer:", top_reviewer)
3

📄

📄 Top Reviewer: Alice

9. Find movies with missing ratings

✓ [14] 1 missing_ratings = df[df['rating'].isnull()]
2 print(missing_ratings[['title', 'rating']])
3

📄

📄 title rating
4 Movie E NaN

📄

 Rajeshwari Wakchaure Python ☆ ☁

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☰

10. Identify the movies with rating exactly 7.5.

✓ [27] 1 exact_movies = df[df['rating'] == 7.5]
2 print(exact_movies[['title', 'rating']])
3

📄

<> title rating
1 Movie B 7.5
4 Movie E 7.5

{x}


11. Sort movies by review date

✓ [17] 1 sorted_df = df.sort_values(by='review_date', ascending=False)
2 print(sorted_df[['title', 'review_date']])
3

📄

📄 title review_date
3 Movie D 2023-03-10
4 Movie E 2023-02-25
1 Movie B 2023-02-15
2 Movie C 2023-01-20
0 Movie A 2023-01-01

📄

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12. Percentage of reviews per genre

🔍

✓ 0s

[18]

```
1 genre_percentages = df['genre'].value_counts(normalize=True) * 100
2 print(genre_percentages)
3
```

<>

{x}

🔄

genre

Action 40.0

Drama 40.0

Comedy 20.0

Name: proportion, dtype: float64

13. Average rating per genre

✓ 0s

▶

```
1 avg_rating_per_genre = df.groupby('genre')['rating'].mean()
2 print(avg_rating_per_genre)
3
```

{x}

🔄

genre


Action 7.0

Comedy 8.5

Drama 7.5

Name: rating, dtype: float64

🖼️

 Rajeshwari Wakchaure Python ☆ ☁

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☰

14. Categorize movies as Hit or Flop

🔍

✓ 0s

[20]

```
1 df['status'] = np.where(df['rating'] > 8, 'Hit', 'Flop')
2 print(df[['title', 'status']])
3
```

<>

{x}

🔄

title status

0 Movie A Hit

1 Movie B Flop

2 Movie C Flop

3 Movie D Hit

4 Movie E Flop

15. Oldest and Newest review dates

✓ 0s

[21]


```
1 oldest_review = df['review_date'].min()
2 newest_review = df['review_date'].max()
3 print("Oldest Review:", oldest_review)
4 print("Newest Review:", newest_review)
5
```

🔄

Oldest Review: 2023-01-01 00:00:00

Newest Review: 2023-03-10 00:00:00

🖼️

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☰

16. Correlation between review date (ordinal) and rating

✓ [22]

```
1 df['review_date_ordinal'] = df['review_date'].map(lambda x: x.toordinal())
2 correlation = np.corrcoef(df['review_date_ordinal'], df['rating'])[0,1]
3 print("Correlation:", correlation)
4
```

↗

Correlation: 0.12060618149368937

📁

17. Top 3 reviewers with highest average rating python Copy Edit

✓ [23]

```
1 top_reviewers = df.groupby('reviewer')['rating'].mean().sort_values(ascending=False).head(3)
2 print(top_reviewers)
3
```

↗

reviewer	rating
Charlie	8.5
Bob	7.5
Alice	7.0

Name: rating, dtype: float64

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✓ RAM Disk ^

☰

18. Find reviews containing 'excellent'

✓ [24]

```
1 excellent_reviews = df[df['review'].str.contains('excellent', case=False, na=False)]
2 print(excellent_reviews[['title', 'review']])
3
```

↗

	title	review
0	Movie A	Excellent movie!
3	Movie D	Excellent comedy!

📁

19. Number of reviews each year


✓ [25]

```
1 df['year'] = df['review_date'].dt.year
2 reviews_per_year = df['year'].value_counts().sort_index()
3 print(reviews_per_year)
4
```

↗

year	count
2023	5

Name: count, dtype: int64



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20. Pivot table: average rating per genre per year

```
[26] 1 pivot_table = pd.pivot_table(df, values='rating', index='genre', columns='year', aggfunc='mean')
      2 print(pivot_table)
      3
```

{x}

year	2023
genre	
Action	7.0
Comedy	8.5
Drama	7.5