EDS Theory Activity 1

Dataset :- Opin Rank Review

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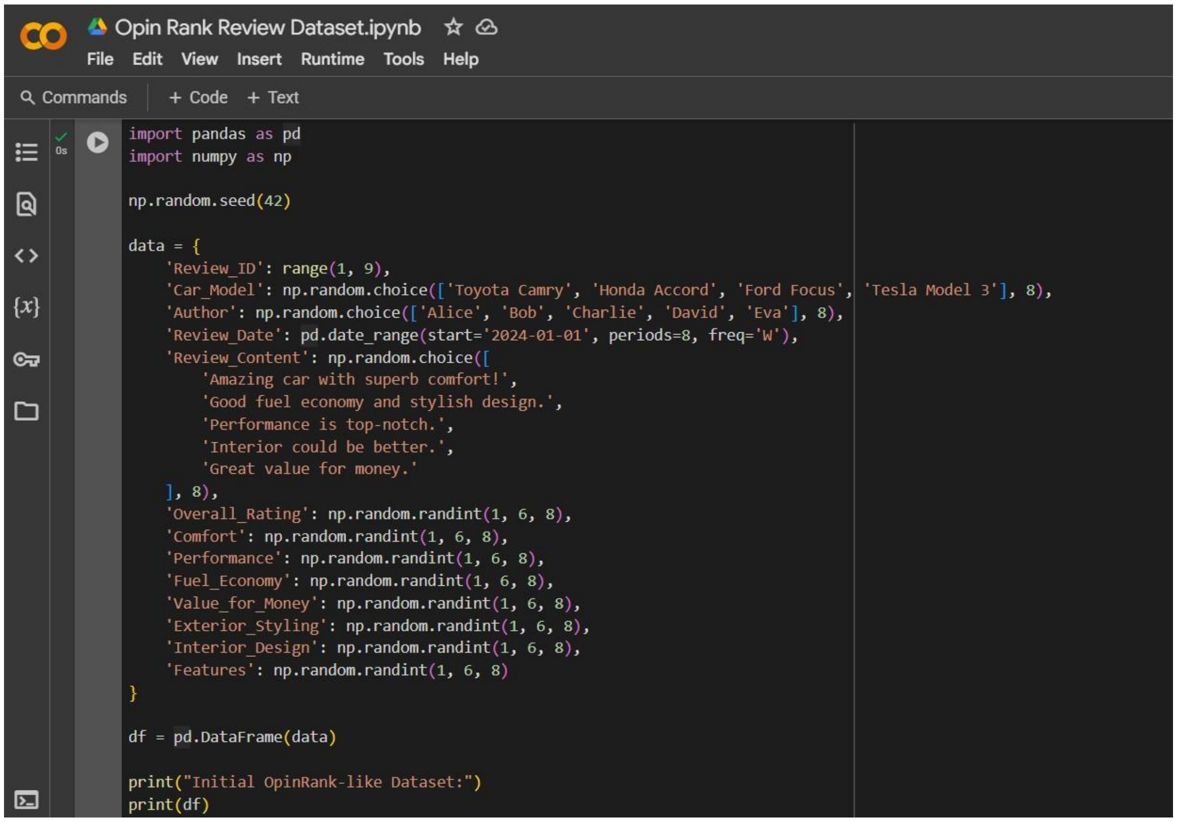
Python Code for Given Dataset:


Opin Rank Review Dataset.ipynb
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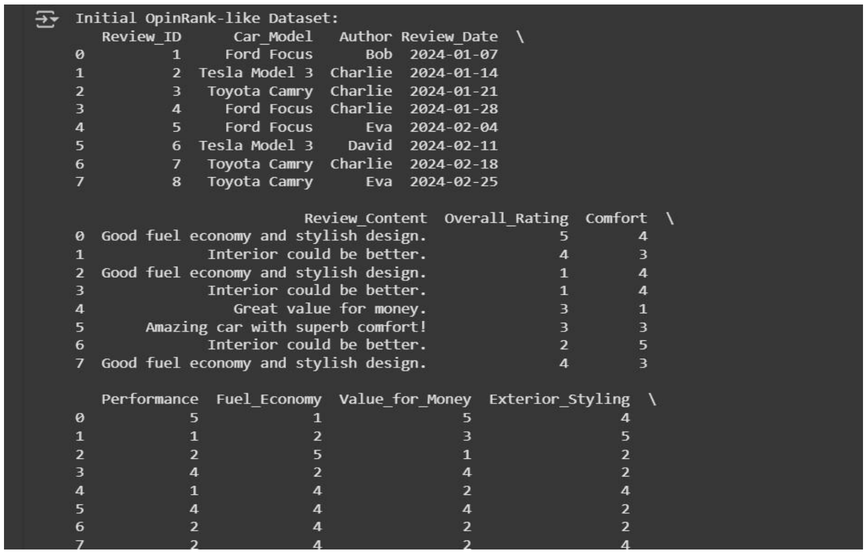
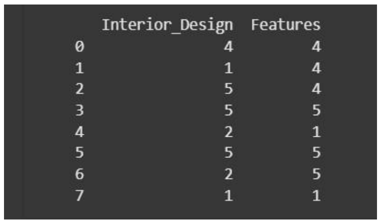
```python
import pandas as pd
import numpy as np

np.random.seed(42)

data = {
    'Review_ID': range(1, 9),
    'Car_Model': np.random.choice(['Toyota Camry', 'Honda Accord', 'Ford Focus', 'Tesla Model 3'], 8),
    'Author': np.random.choice(['Alice', 'Bob', 'Charlie', 'David', 'Eva'], 8),
    'Review_Date': pd.date_range(start='2024-01-01', periods=8, freq='W'),
    'Review_Content': np.random.choice([
        'Amazing car with superb comfort!',
        'Good fuel economy and stylish design.',
        'Performance is top-notch.',
        'Interior could be better.',
        'Great value for money.'
    ], 8),
    'Overall_Rating': np.random.randint(1, 6, 8),
    'Comfort': np.random.randint(1, 6, 8),
    'Performance': np.random.randint(1, 6, 8),
    'Fuel_Economy': np.random.randint(1, 6, 8),
    'Value_for_Money': np.random.randint(1, 6, 8),
    'Exterior_Styling': np.random.randint(1, 6, 8),
    'Interior_Design': np.random.randint(1, 6, 8),
    'Features': np.random.randint(1, 6, 8)
}

df = pd.DataFrame(data)

print("Initial OpinRank-like Dataset:")
print(df)
```

Output:



```
Initial OpinRank-like Dataset:
   Review_ID      Car_Model   Author Review_Date  \
0          1     Ford Focus      Bob  2024-01-07
1          2  Tesla Model 3  Charlie  2024-01-14
2          3   Toyota Camry  Charlie  2024-01-21
3          4     Ford Focus  Charlie  2024-01-28
4          5     Ford Focus      Eva  2024-02-04
5          6  Tesla Model 3    David  2024-02-11
6          7   Toyota Camry  Charlie  2024-02-18
7          8   Toyota Camry      Eva  2024-02-25

                          Review_Content  Overall_Rating  Comfort  \
0  Good fuel economy and stylish design.               5        4
1              Interior could be better.               4        3
2  Good fuel economy and stylish design.               1        4
3              Interior could be better.               1        4
4                 Great value for money.               3        1
5       Amazing car with superb comfort!               3        3
6              Interior could be better.               2        5
7  Good fuel economy and stylish design.               4        3

   Performance  Fuel_Economy  Value_for_Money  Exterior_Styling  \
0            5             1                5                 4
1            1             2                3                 5
2            2             5                1                 2
3            4             2                4                 2
4            1             4                2                 4
5            4             4                4                 2
6            2             4                2                 2
7            2             4                2                 4
```

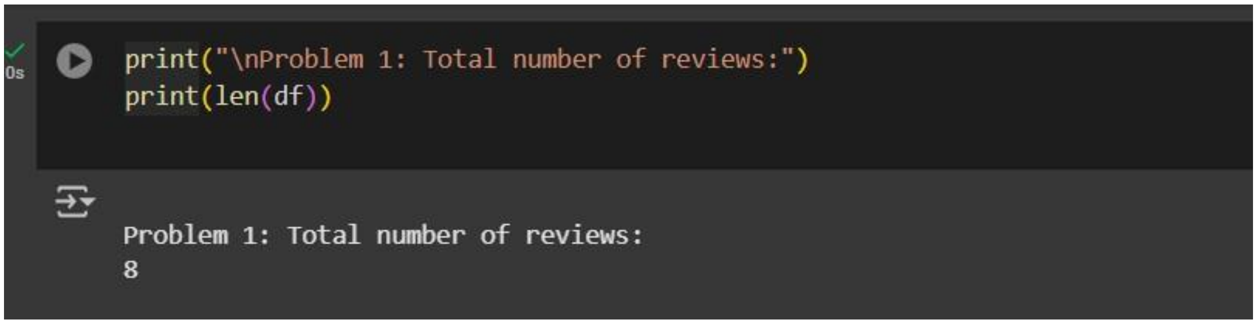


```
   Interior_Design  Features
0                4         4
1                1         4
2                5         4
3                5         5
4                2         1
5                5         5
6                2         5
7                1         1
```

Problem Statements:

Problem 1:

Find the total number of reviews.

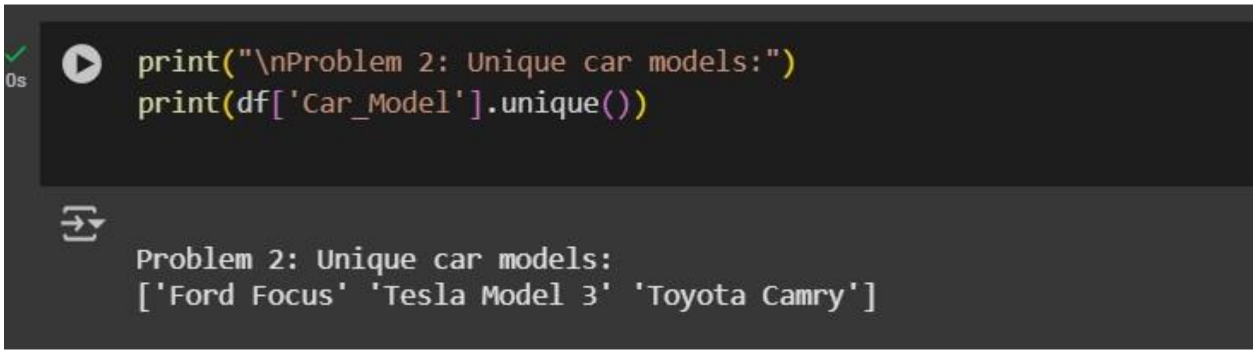


```
print("\nProblem 1: Total number of reviews:")
print(len(df))
```

```

Problem 1: Total number of reviews:
8
```

Problem 2:

Find unique car models reviewed.

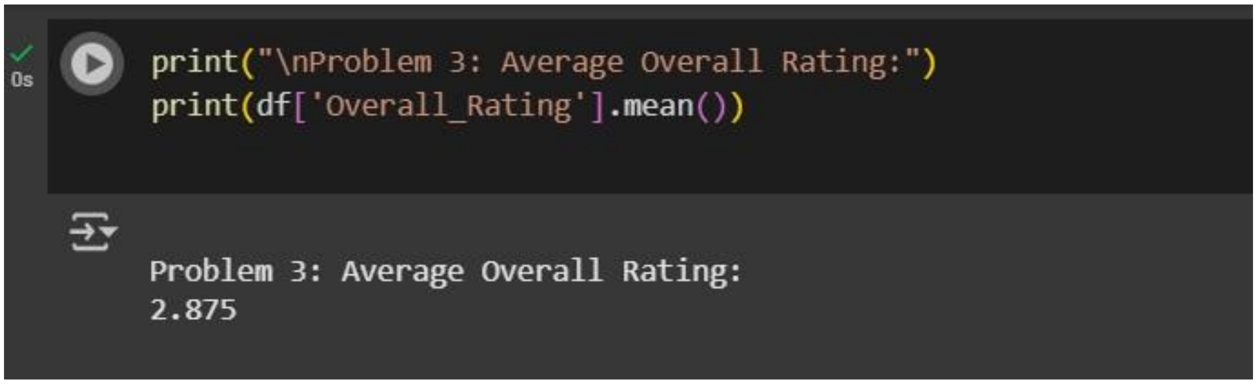


```
print("\nProblem 2: Unique car models:")
print(df['Car_Model'].unique())
```

```

Problem 2: Unique car models:
['Ford Focus' 'Tesla Model 3' 'Toyota Camry']
```

Problem 3:

Find the average Overall Rating.

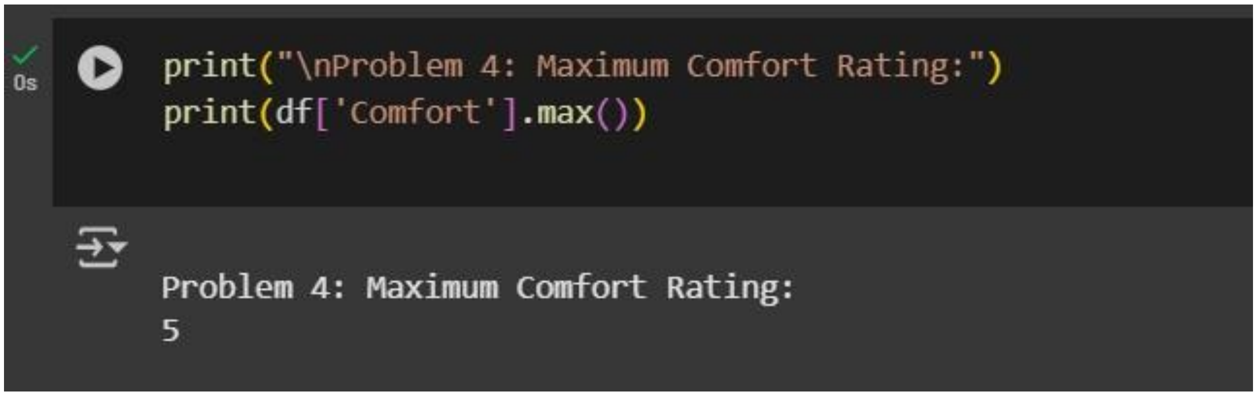


```
print("\nProblem 3: Average Overall Rating:")
print(df['Overall_Rating'].mean())
```

```

Problem 3: Average Overall Rating:
2.875
```

Problem 4:

Find the maximum Comfort rating.

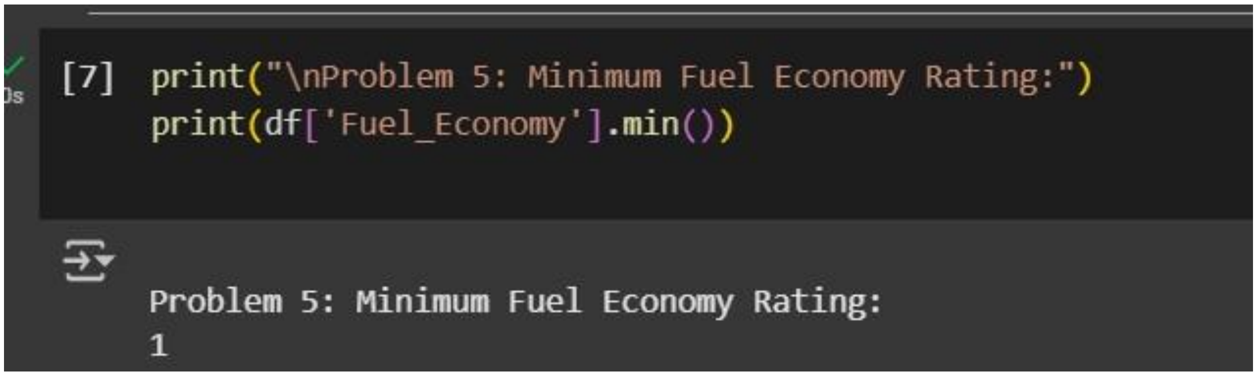


```
print("\nProblem 4: Maximum Comfort Rating:")
print(df['Comfort'].max())
```

```
Problem 4: Maximum Comfort Rating:
5
```

Problem 5:

Find the minimum Fuel Economy rating.

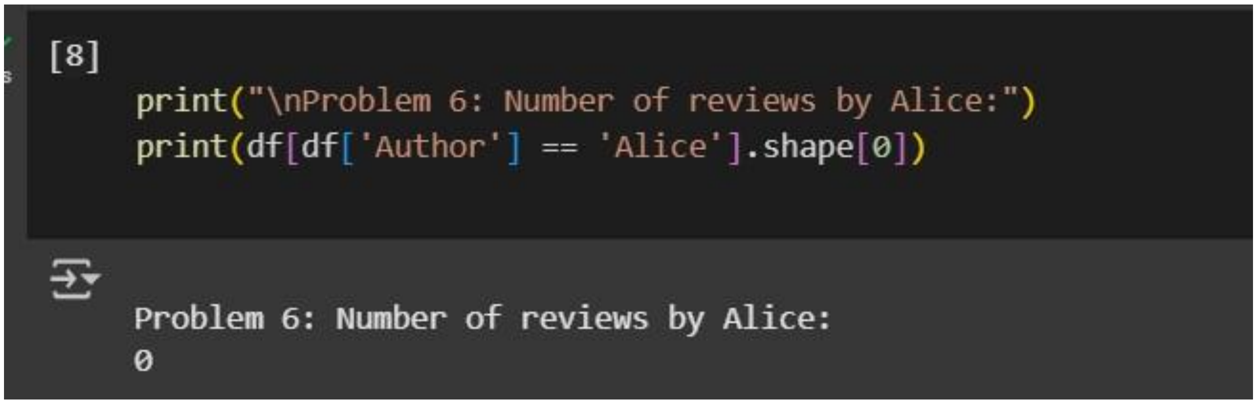


```
[7] print("\nProblem 5: Minimum Fuel Economy Rating:")
    print(df['Fuel_Economy'].min())
```

```
Problem 5: Minimum Fuel Economy Rating:
1
```

Problem 6:

Find how many reviews were written by 'Alice'.

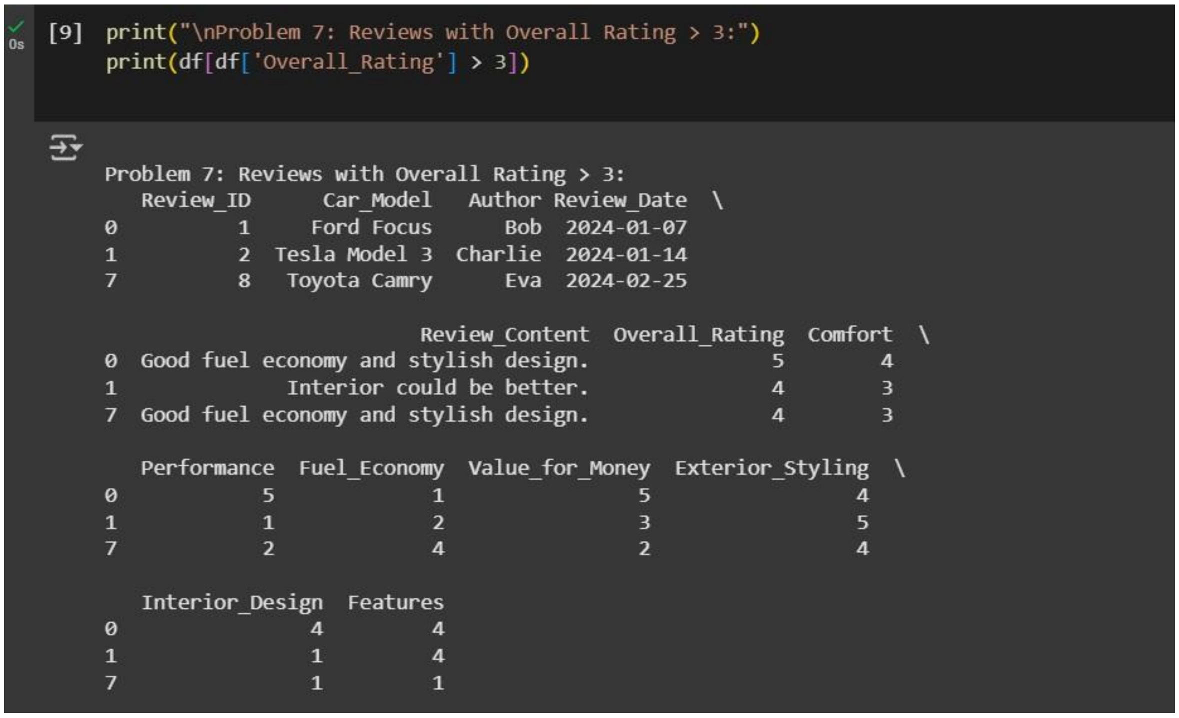


```
[8]
    print("\nProblem 6: Number of reviews by Alice:")
    print(df[df['Author'] == 'Alice'].shape[0])
```

```
Problem 6: Number of reviews by Alice:
0
```

Problem 7:

List all reviews with Overall Rating greater than 3.

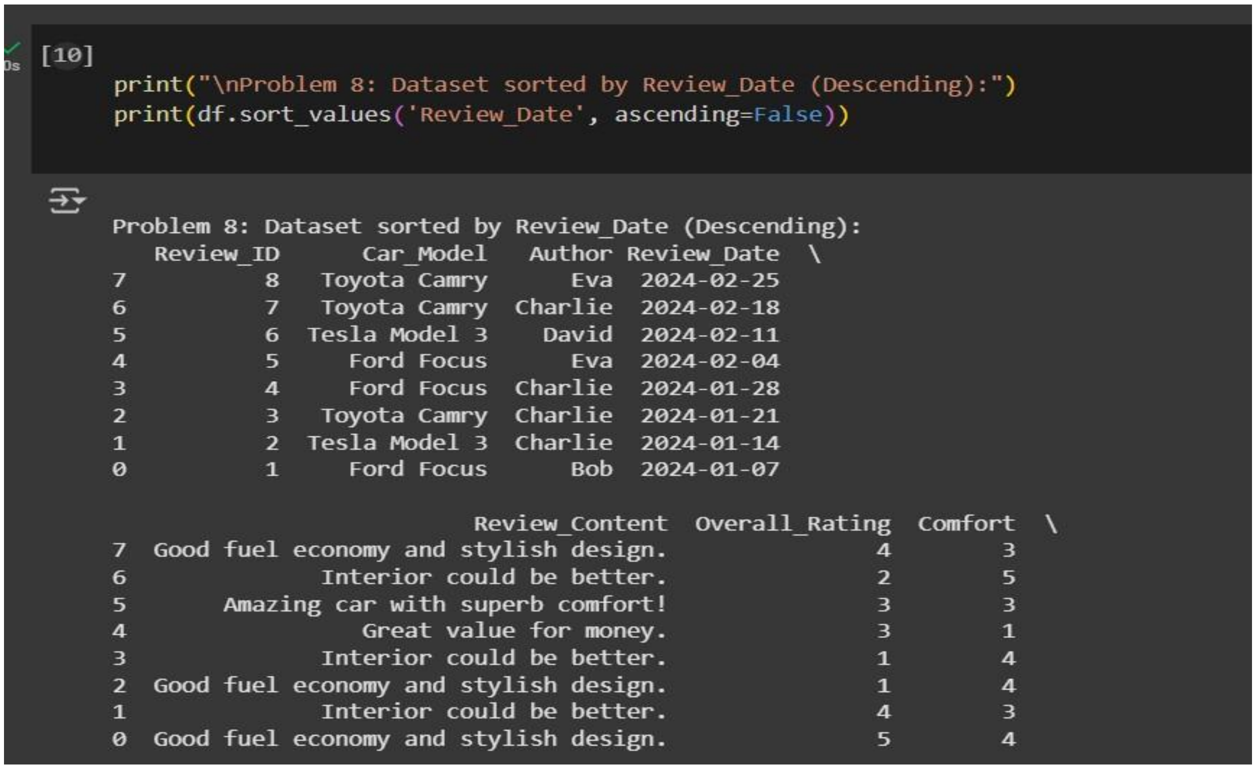


```
[9] print("\nProblem 7: Reviews with Overall Rating > 3:")
    print(df[df['Overall_Rating'] > 3])
```

```
Problem 7: Reviews with Overall Rating > 3:
   Review_ID      Car_Model   Author Review_Date  \
0          1     Ford Focus      Bob  2024-01-07
1          2  Tesla Model 3  Charlie  2024-01-14
7          8   Toyota Camry      Eva  2024-02-25

                       Review_Content  Overall_Rating  Comfort  \
0  Good fuel economy and stylish design.               5        4
1             Interior could be better.               4        3
7  Good fuel economy and stylish design.               4        3

   Performance  Fuel_Economy  Value_for_Money  Exterior_Styling  \
0            5             1                5                 4
1            1             2                3                 5
7            2             4                2                 4

   Interior_Design  Features
0                4         4
1                1         4
7                1         1
```

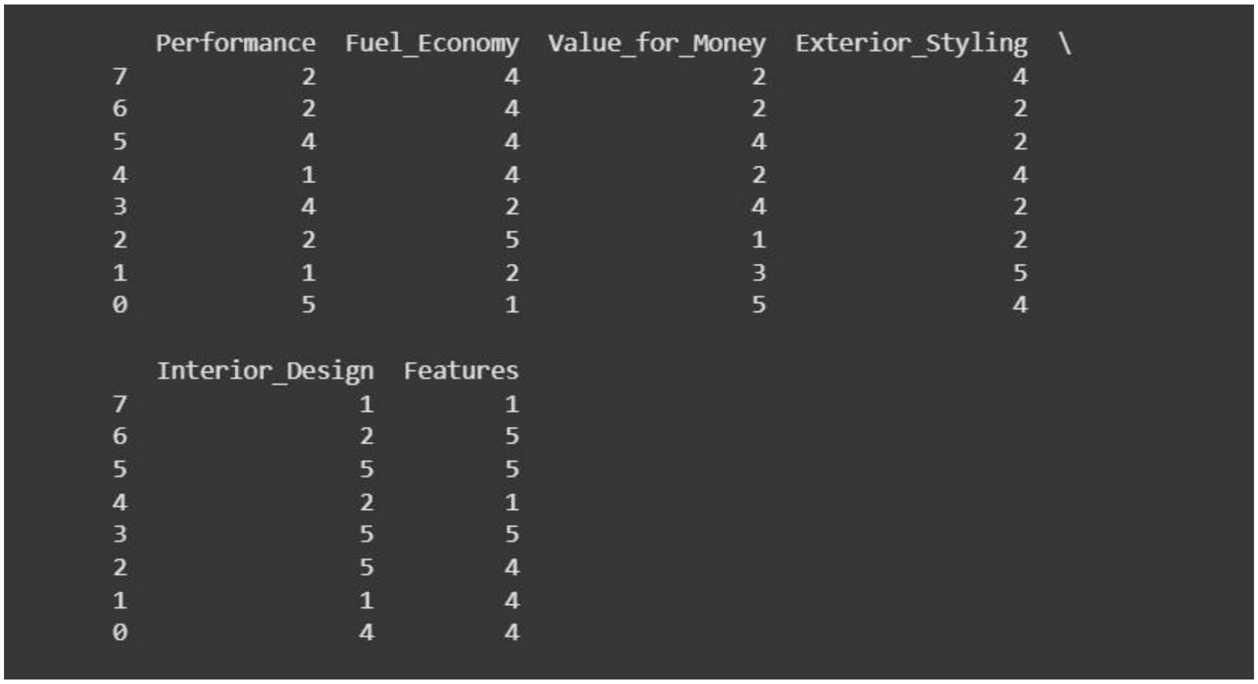
Problem 8:

Sort the dataset by Review_Date in descending order.



```
[10]
    print("\nProblem 8: Dataset sorted by Review_Date (Descending):")
    print(df.sort_values('Review_Date', ascending=False))
```

```
Problem 8: Dataset sorted by Review_Date (Descending):
   Review_ID      Car_Model   Author Review_Date  \
7          8   Toyota Camry      Eva  2024-02-25
6          7   Toyota Camry  Charlie  2024-02-18
5          6  Tesla Model 3    David  2024-02-11
4          5     Ford Focus      Eva  2024-02-04
3          4     Ford Focus  Charlie  2024-01-28
2          3   Toyota Camry  Charlie  2024-01-21
1          2  Tesla Model 3  Charlie  2024-01-14
0          1     Ford Focus      Bob  2024-01-07

                        Review_Content  Overall_Rating  Comfort  \
7  Good fuel economy and stylish design.               4        3
6              Interior could be better.               2        5
5         Amazing car with superb comfort!               3        3
4                 Great value for money.               3        1
3              Interior could be better.               1        4
2  Good fuel economy and stylish design.               1        4
1              Interior could be better.               4        3
0  Good fuel economy and stylish design.               5        4
```

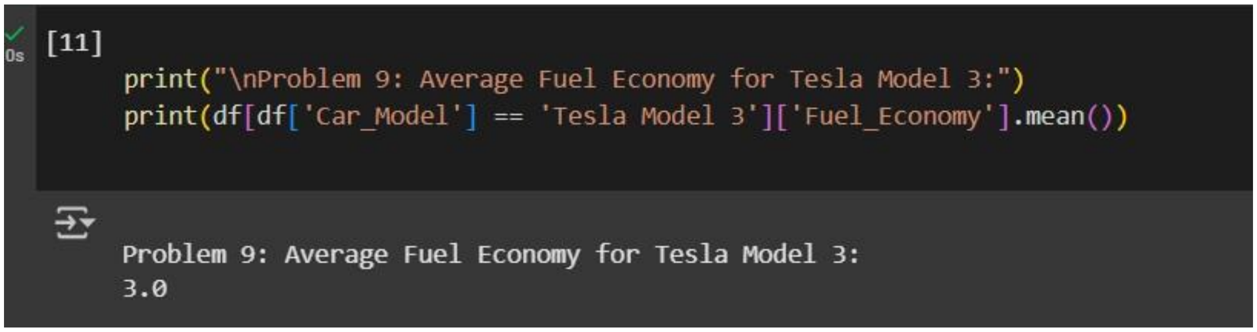


```
   Performance  Fuel_Economy  Value_for_Money  Exterior_Styling  \
7            2             4                2                 4
6            2             4                2                 2
5            4             4                4                 2
4            1             4                2                 4
3            4             2                4                 2
2            2             5                1                 2
1            1             2                3                 5
0            5             1                5                 4

   Interior_Design  Features
7                1         1
6                2         5
5                5         5
4                2         1
3                5         5
2                5         4
1                1         4
0                4         4
```

Problem

9:

Find the average Fuel Economy rating for Tesla Model 3.

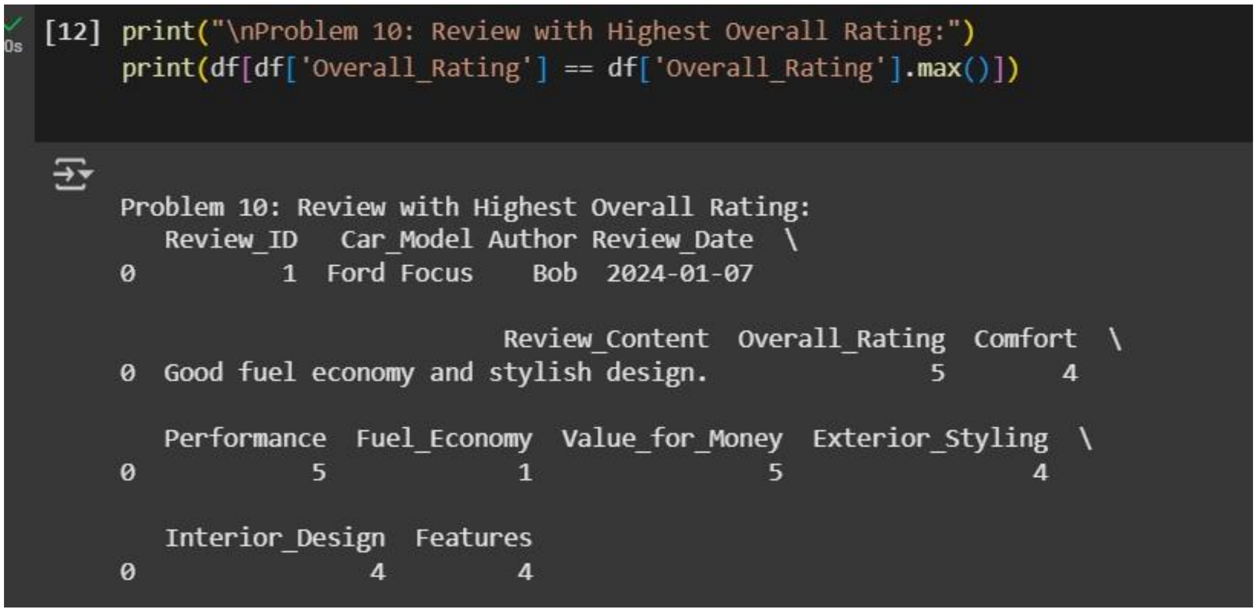


```
[11]
print("\nProblem 9: Average Fuel Economy for Tesla Model 3:")
print(df[df['Car_Model'] == 'Tesla Model 3']['Fuel_Economy'].mean())
```

```
Problem 9: Average Fuel Economy for Tesla Model 3:
3.0
```

Problem 10:

Get the review with the highest Overall Rating.



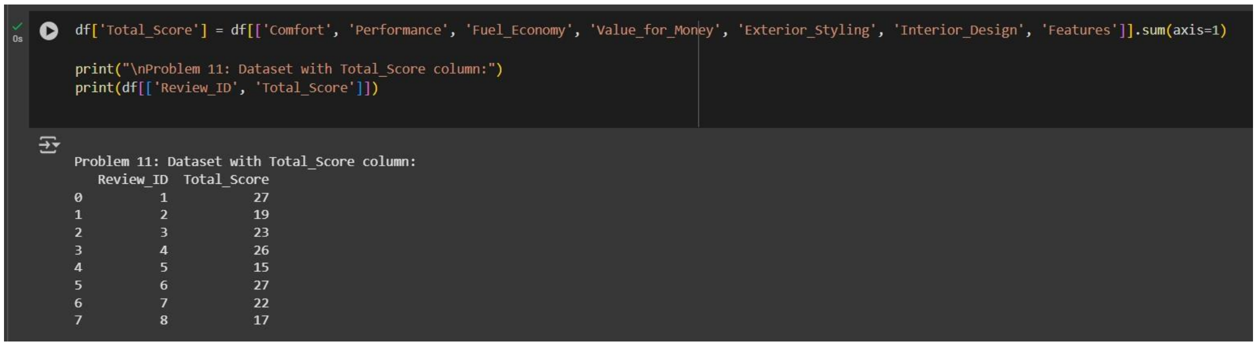
```
[12] print("\nProblem 10: Review with Highest Overall Rating:")
print(df[df['Overall_Rating'] == df['Overall_Rating'].max()])
```

```
Problem 10: Review with Highest Overall Rating:
   Review_ID   Car_Model Author Review_Date  \
0          1  Ford Focus    Bob  2024-01-07

                       Review_Content  Overall_Rating  Comfort  \
0  Good fuel economy and stylish design.              5        4

   Performance  Fuel_Economy  Value_for_Money  Exterior_Styling  \
0            5             1                5                 4

   Interior_Design  Features
0                4         4
```

11:

Add a new column "Total_Score" = Sum of all feature ratings (Comfort, Performance, etc.)

Problem

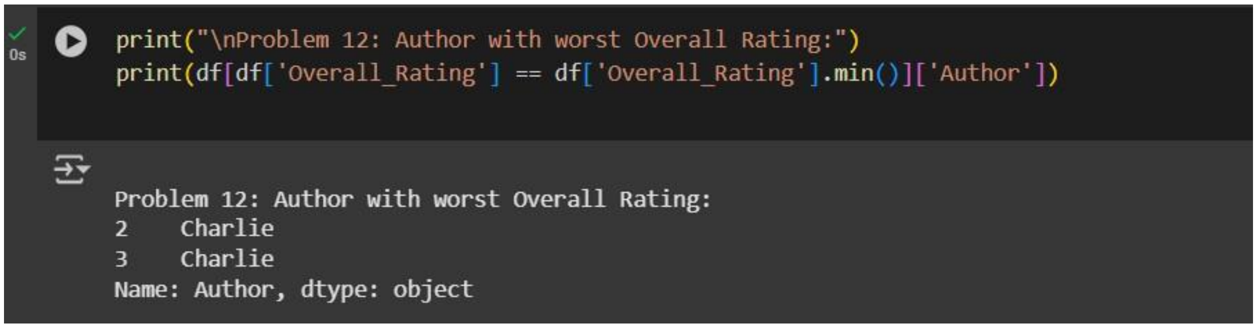


```
df['Total_Score'] = df[['Comfort', 'Performance', 'Fuel_Economy', 'Value_for_Money', 'Exterior_Styling', 'Interior_Design', 'Features']].sum(axis=1)

print("\nProblem 11: Dataset with Total_Score column:")
print(df[['Review_ID', 'Total_Score']])
```

```
Problem 11: Dataset with Total_Score column:
   Review_ID  Total_Score
0          1           27
1          2           19
2          3           23
3          4           26
4          5           15
5          6           27
6          7           22
7          8           17
```

Problem 12:

Find the author who gave the worst Overall Rating.

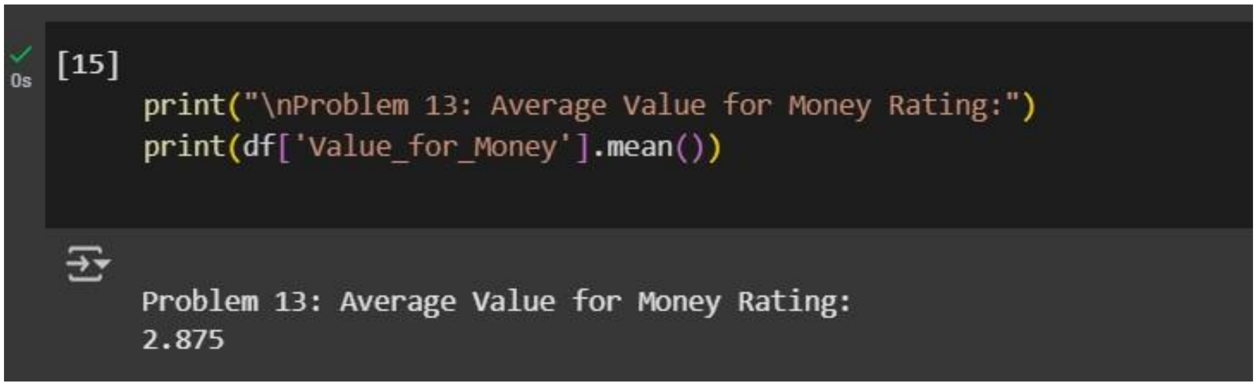


```
print("\nProblem 12: Author with worst Overall Rating:")
print(df[df['Overall_Rating'] == df['Overall_Rating'].min()]['Author'])
```

```
Problem 12: Author with worst Overall Rating:
2    Charlie
3    Charlie
Name: Author, dtype: object
```

Problem 13:

Find the average Value for Money rating.



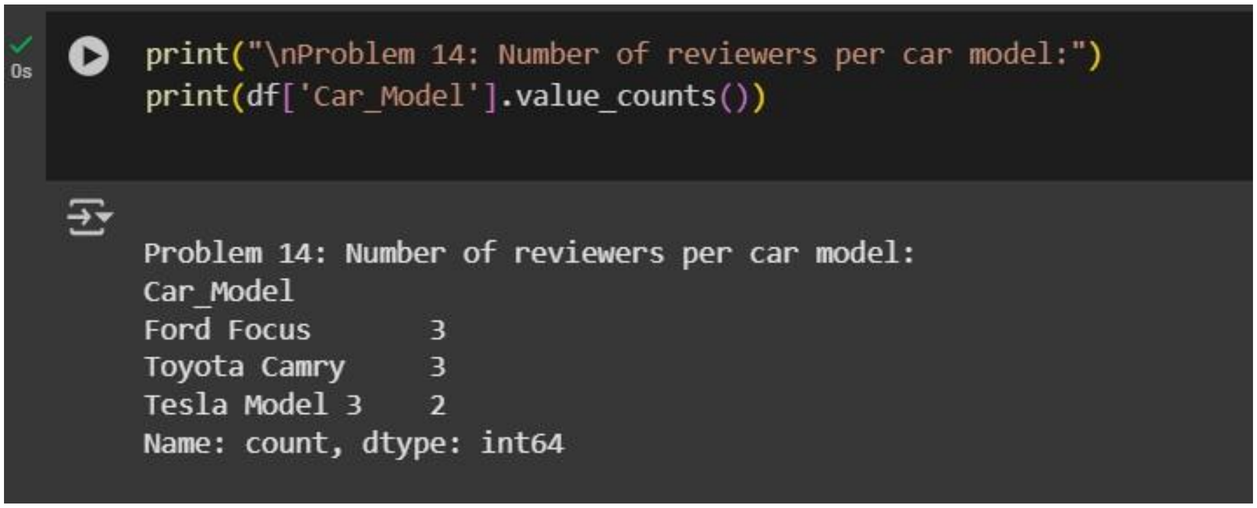
```
[15]
print("\nProblem 13: Average Value for Money Rating:")
print(df['Value_for_Money'].mean())
```

```
Problem 13: Average Value for Money Rating:
2.875
```

14:

Count the number of reviewers per car model.

Problem

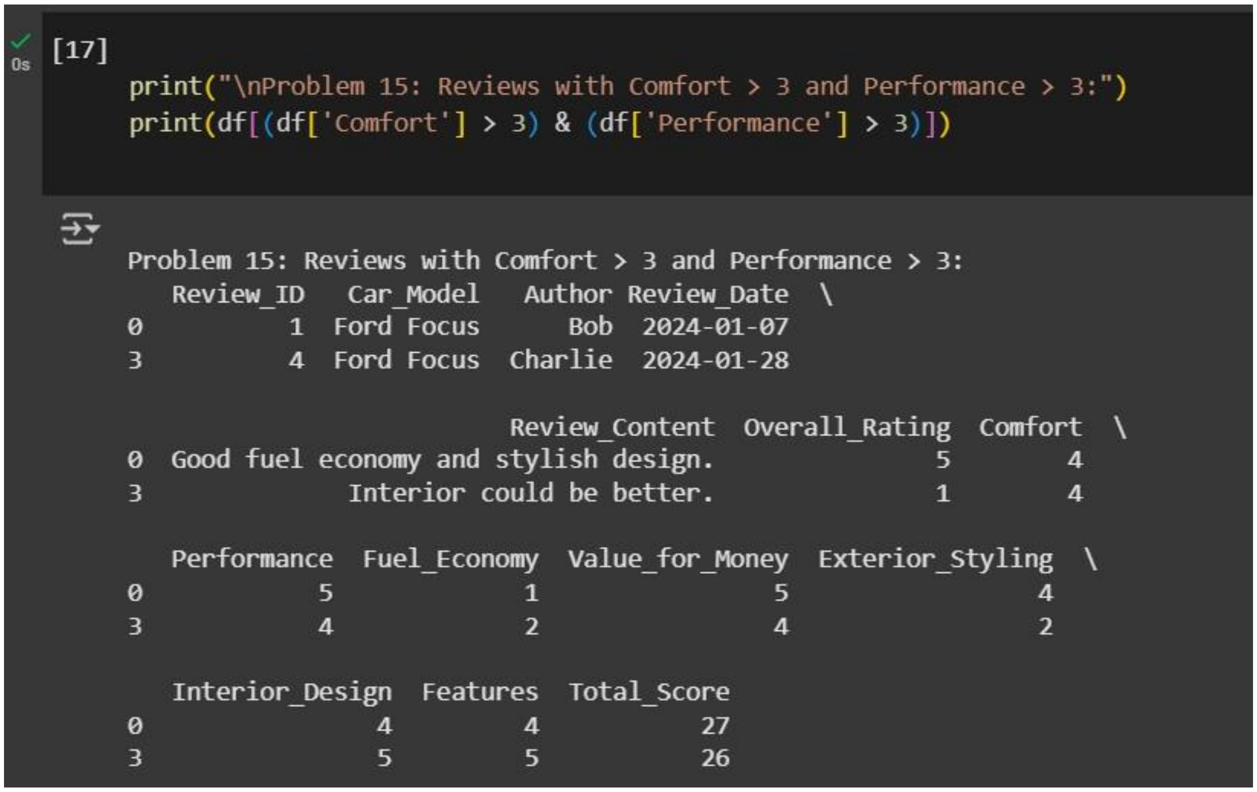


```
print("\nProblem 14: Number of reviewers per car model:")
print(df['Car_Model'].value_counts())
```

```
Problem 14: Number of reviewers per car model:
Car_Model
Ford Focus       3
Toyota Camry     3
Tesla Model 3    2
Name: count, dtype: int64
```

Problem 15:

Find reviews where Comfort and Performance both are greater than 3.



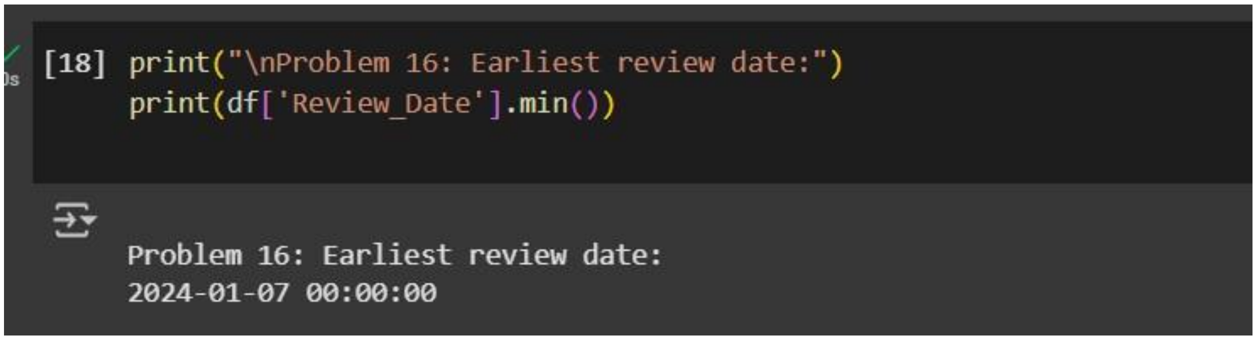
```
[17]
print("\nProblem 15: Reviews with Comfort > 3 and Performance > 3:")
print(df[(df['Comfort'] > 3) & (df['Performance'] > 3)])
```

```
Problem 15: Reviews with Comfort > 3 and Performance > 3:
   Review_ID   Car_Model   Author Review_Date  \
0          1  Ford Focus      Bob  2024-01-07
3          4  Ford Focus  Charlie  2024-01-28

                        Review_Content  Overall_Rating  Comfort  \
0  Good fuel economy and stylish design.               5        4
3            Interior could be better.               1        4

   Performance  Fuel_Economy  Value_for_Money  Exterior_Styling  \
0            5             1                5                 4
3            4             2                4                 2

   Interior_Design  Features  Total_Score
0                4         4           27
3                5         5           26
```

16:

Find the earliest review date.

Problem

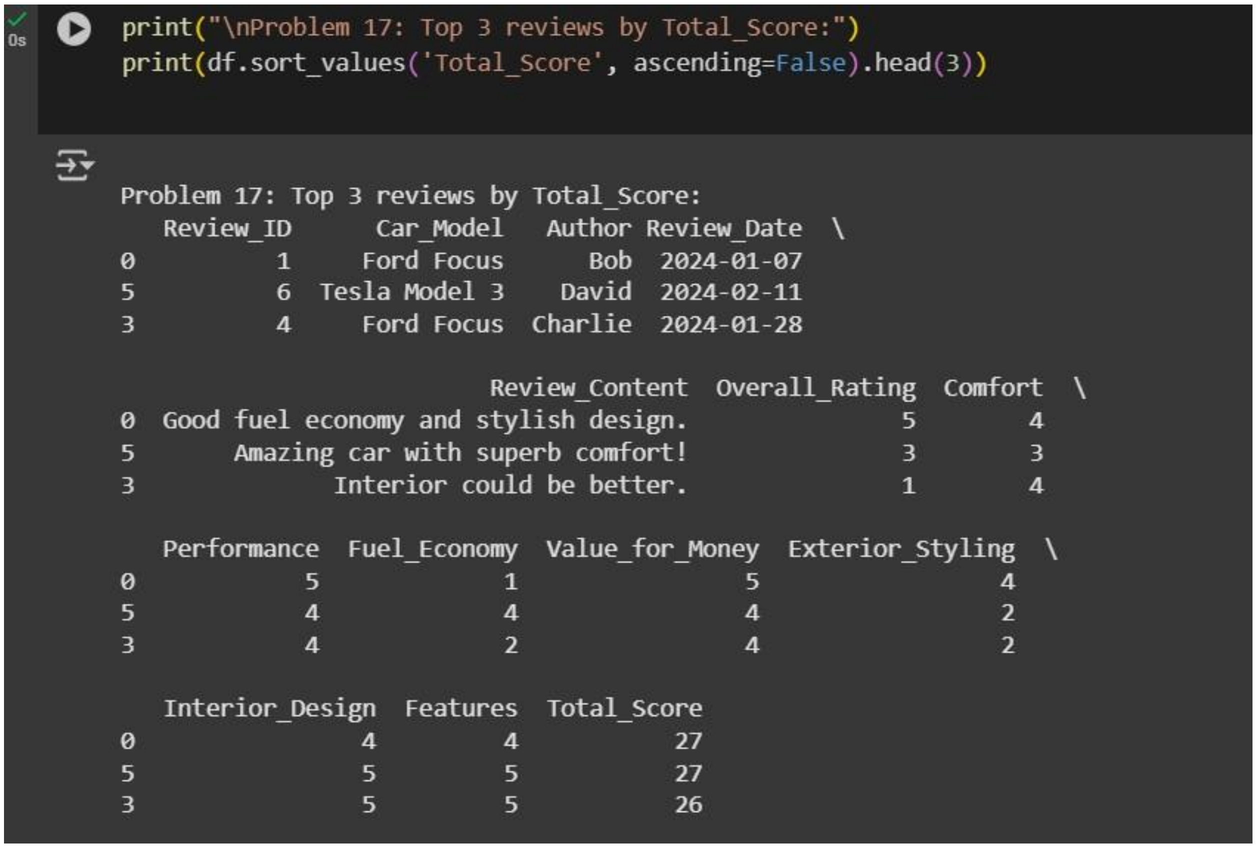


```
[18] print("\nProblem 16: Earliest review date:")
     print(df['Review_Date'].min())
```

```

Problem 16: Earliest review date:
2024-01-07 00:00:00
```

Problem 17:

Get top 3 reviews by Total_Score.

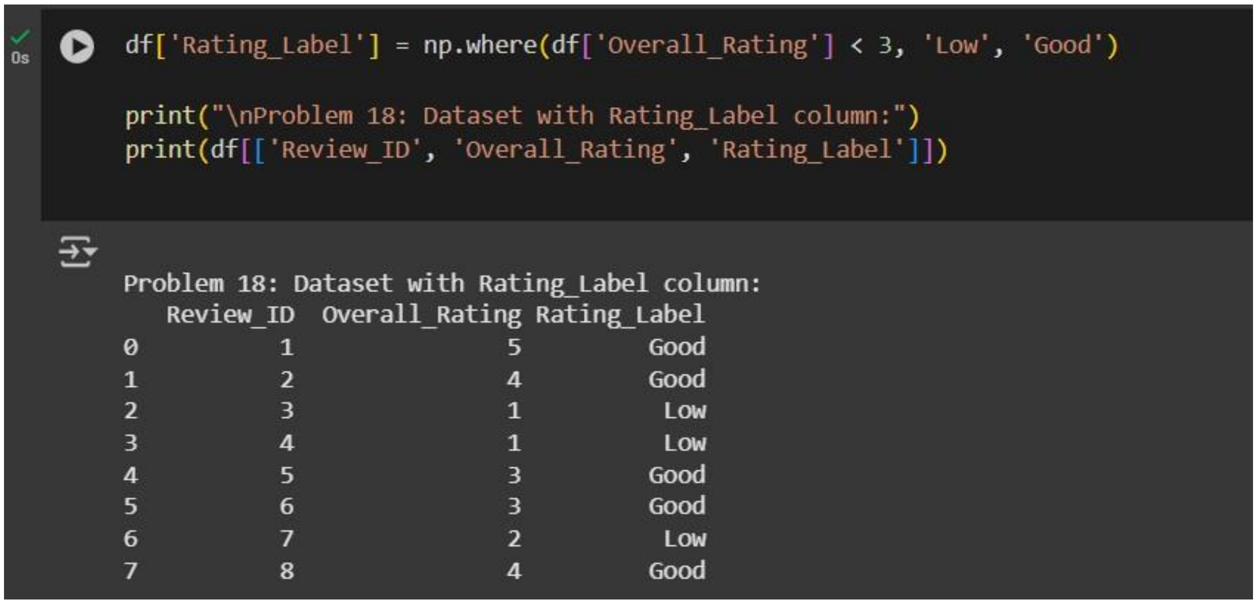


```
print("\nProblem 17: Top 3 reviews by Total_Score:")
print(df.sort_values('Total_Score', ascending=False).head(3))
```

```

Problem 17: Top 3 reviews by Total_Score:
   Review_ID      Car_Model   Author Review_Date  \
0          1     Ford Focus      Bob  2024-01-07
5          6  Tesla Model 3    David  2024-02-11
3          4     Ford Focus  Charlie  2024-01-28

                         Review_Content  Overall_Rating  Comfort  \
0  Good fuel economy and stylish design.               5        4
5      Amazing car with superb comfort!               3        3
3             Interior could be better.               1        4

   Performance  Fuel_Economy  Value_for_Money  Exterior_Styling  \
0            5             1                5                 4
5            4             4                4                 2
3            4             2                4                 2

   Interior_Design  Features  Total_Score
0                4         4           27
5                5         5           27
3                5         5           26
```

Problem 18:

Replace all Overall Ratings less than 3 with 'Low'.

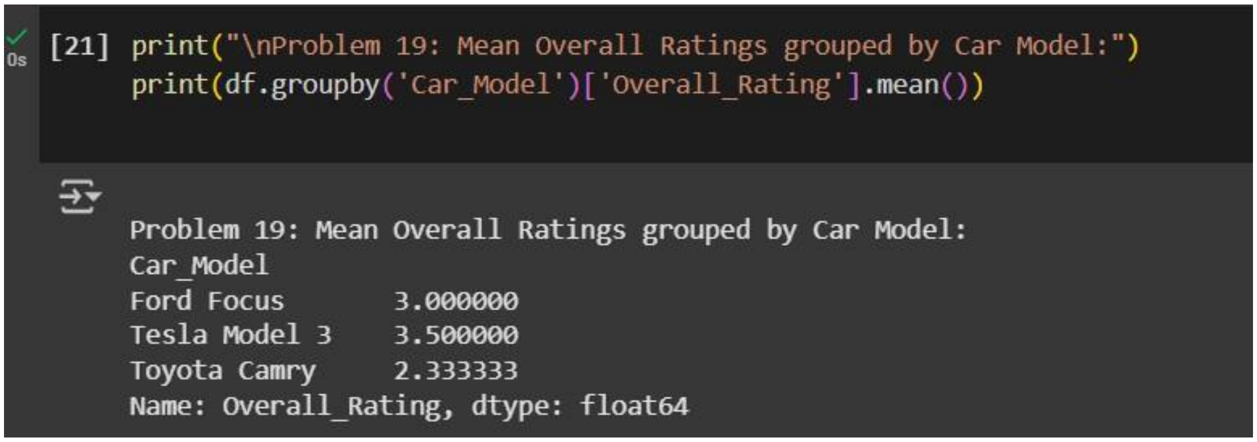


```
df['Rating_Label'] = np.where(df['Overall_Rating'] < 3, 'Low', 'Good')

print("\nProblem 18: Dataset with Rating_Label column:")
print(df[['Review_ID', 'Overall_Rating', 'Rating_Label']])
```

```
Problem 18: Dataset with Rating_Label column:
   Review_ID  Overall_Rating Rating_Label
0          1               5         Good
1          2               4         Good
2          3               1          Low
3          4               1          Low
4          5               3         Good
5          6               3         Good
6          7               2          Low
7          8               4         Good
```

Problem 19:

Find mean ratings for each car model grouped together.

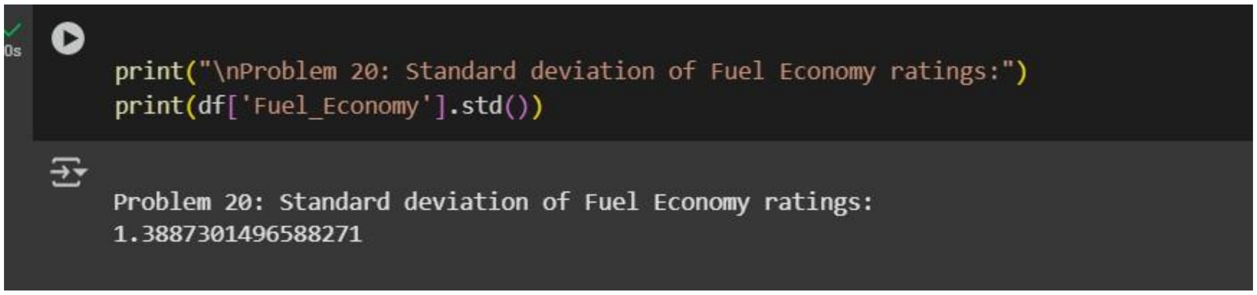


```
[21] print("\nProblem 19: Mean Overall Ratings grouped by Car Model:")
     print(df.groupby('Car_Model')['Overall_Rating'].mean())
```

```
Problem 19: Mean Overall Ratings grouped by Car Model:
Car_Model
Ford Focus       3.000000
Tesla Model 3    3.500000
Toyota Camry     2.333333
Name: Overall_Rating, dtype: float64
```

Problem 20:

Find standard deviation of Fuel Economy ratings.



```python
print("\nProblem 20: Standard deviation of Fuel Economy ratings:")
print(df['Fuel_Economy'].std())
```

```
Problem 20: Standard deviation of Fuel Economy ratings:
1.3887301496588271
```