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```
[1] import numpy as np # linear algebra
    import pandas as pd # data processing, CSV file I/O (e.g. pd.read_csv)
```

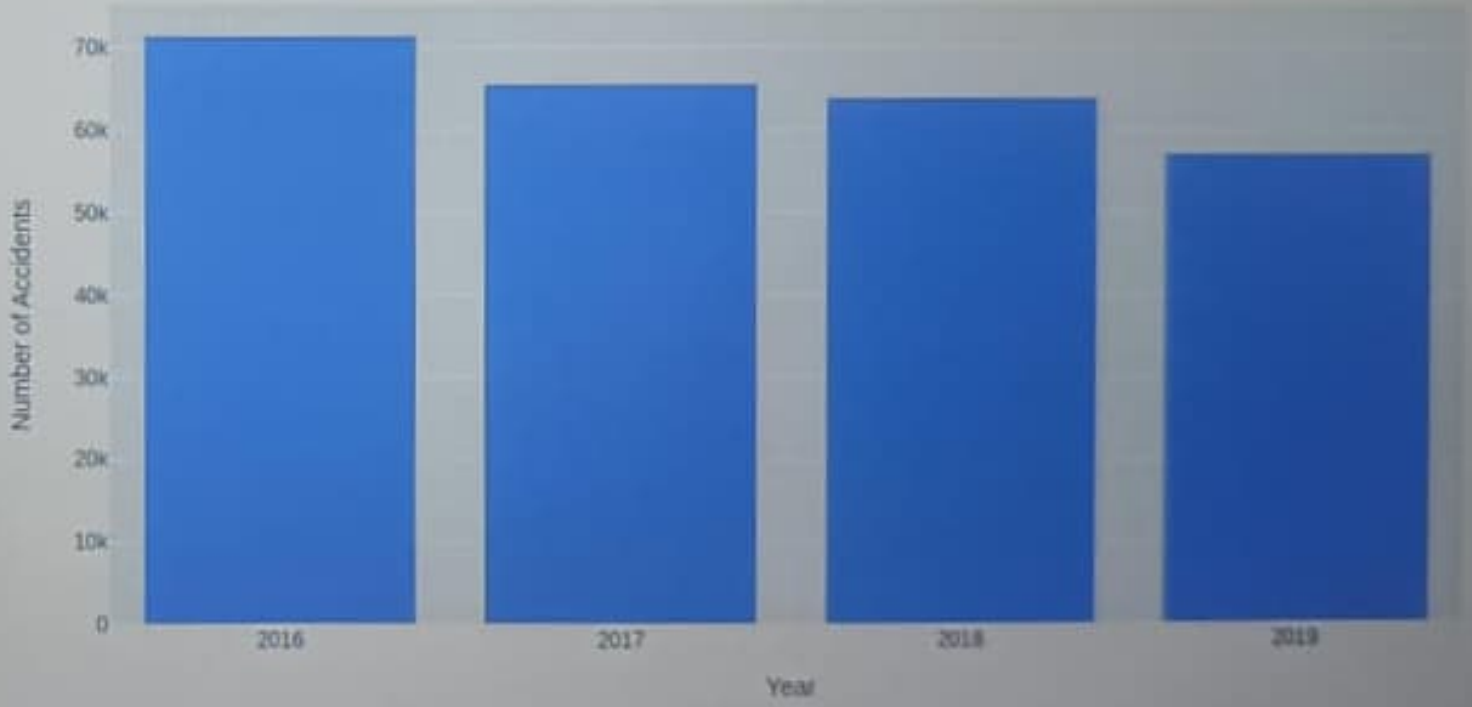
```
df = pd.read_csv('/content/RA2019_A2.csv')
df
```

	States/UTs	State/UT-Wise Total Number of Road Accidents during 2016	State/UT-Wise Total Number of Road Accidents during 2017	State/UT-Wise Total Number of Road Accidents during 2018	State/UT-Wise Total Number of Road Accidents during 2019 - Numbers	State/UT-Wise Total Number of Road Accidents during 2019 - Rank	Share of States/UTs in Total Number of Road Accidents - 2016	Share of States/UTs in Total Number of Road Accidents - 2017	Share of States/UTs in Total Number of Road Accidents - 2018	Sha State in Numb Acci -
0	Andhra Pradesh	24888	25727	24475	21992	8.0	5.177967	5.533759	5.240406	4.8
1	Arunachal Pradesh	249	241	277	237	30.0	0.051805	0.051838	0.059309	0.0

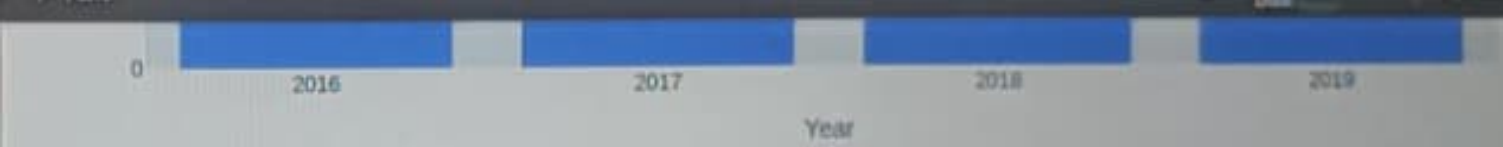
	States/UTs	State/UT-Wise Total Number of Road Accidents during 2016	State/UT-Wise Total Number of Road Accidents during 2017	State/UT-Wise Total Number of Road Accidents during 2018	State/UT-Wise Total Number of Road Accidents during 2019 - Numbers	State/UT-Wise Total Number of Road Accidents during 2019 - Rank	Share of States/UTs in Total Number of Road Accidents - 2016	Share of States/UTs in Total Number of Road Accidents - 2017	Share of States/UTs in Total Number of Road Accidents - 2018	Sha State in Numb Acci -
0	Andhra Pradesh	24888	25727	24475	21992	8.0	5.177967	5.533759	5.240406	4.8
1	Arunachal	249	241	277	237	30.0	0.051805	0.051838	0.059309	0.0

	Pradesh									
9	Jammu and Kashmir	5501	5624	5978	5796	18.0	1.144487	1.209696	1.279965	
10	Jharkhand	4932	5198	5394	5217	20.0	1.026106	1.118066	1.154923	
11	Karnataka	44403	42542	41707	40658	5.0	9.238077	9.150588	8.929994	
12	Kerala	39420	38470	40181	41111	4.0	8.201360	8.274720	8.603258	
13	Madhya Pradesh	53972	53399	51397	50669	2.0	11.228914	11.485879	11.004745	1
14	Maharashtra	39878	35853	35717	32925	6.0	8.296647	7.711815	7.647459	7
15	Manipur	538	578	601	672	25.0	0.111931	0.124325	0.128682	0
16	Meghalaya	620	675	399	482	27.0	0.128991	0.145189	0.085431	0
17	Mizoram	83	68	53	62	35.0	0.017268	0.014626	0.011348	0.
18	Nagaland	75	531	430	358	28.0	0.015604	0.114216	0.092068	0.
19	Odisha	10532	10855	11262	11064	12.0	2.191190	2.334861	2.411336	2.4
20	Punjab	6952	6273	6428	6348	17.0	1.446369	1.349293	1.376316	1.4
21	Rajasthan	23066	22112	21743	23480	7.0	4.798898	4.756189	4.655450	5.2

1.5M
1M
0.5M
0
Value
Andhra Pradesh
Assam
Chhattisgarh
Gujarat
Himachal Pradesh
Jharkhand
Kerala
Maharashtra
Meghalaya
Nagaland
Punjab
Sikkim
Telangana
Uttarakhand
West Bengal
Chandigarh
Daman and Diu
Lakshadweep
Total
States/UTs
State/UT-Wise Total Number of Road Accidents during 2018
State/UT-Wise Total Number of Road Accidents during 2019 - Numbers



Accidents in Madhya Pradesh



Accidents in Madhya Pradesh

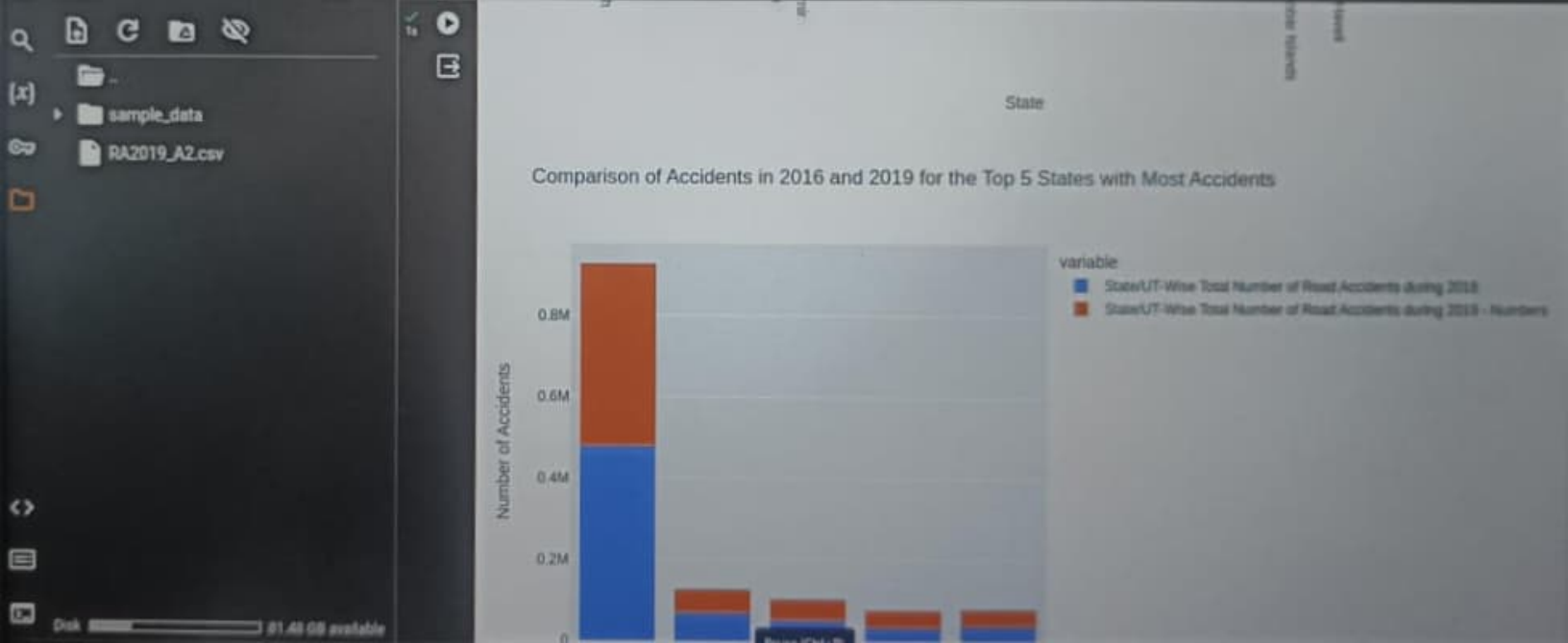
[5]
```python
# Graph 1: Total Accidents by State during 2019
fig1 = px.bar(df, x='States/UTs', y='State/UT-Wise Total Number of Road Accidents during 2019 - Number',
              title='Total Accidents by State during 2019')
fig1.update_layout(xaxis_title='State', yaxis_title='Number of Accidents')
fig1.show()

# Graph 2: Comparison of Accidents in 2016 and 2019 for the Top 5 States with Most Accidents
top_states = df.nlargest(5, 'State/UT-Wise Total Number of Road Accidents during 2019 - Numbers')
fig2 = px.bar(top_states, x='States/UTs', y=['State/UT-Wise Total Number of Road Accidents during 2016', 'Stat
              title='Comparison of Accidents in 2016 and 2019 for the Top 5 States with Most Accidents')
fig2.update_layout(xaxis_title='State', yaxis_title='Number of Accidents')
fig2.show()

# Graph 3: Ranking of Accidents by State in 2019
fig3 = px.bar(df, x='States/UTs', y='State/UT-Wise Total Number of Road Accidents during 2019 - Rank',
              title='Ranking of Accidents by State in 2019')
fig3.update_layout(xaxis_title='State', yaxis_title='Ranking')
fig3.show()

# Graph 4: Percentage of Accidents in 2019 by State
fig4 = px.pie(df, names='States/UTs', values='Share of States/UTs in Total Number of Road Accidents - 2019',
              title='Percentage of Accidents in 2019 by State')
fig4.show()
df
```


Total Accidents by State during 2019
Number of Accidents
400k
300k
200k
100k
0
Andhra Pradesh
Arunachal Pradesh
Assam
Bihar
Chhattisgarh
Goa
Gujarat
Haryana
Himachal Pradesh
Jammu and Kashmir
Jharkhand
Karnataka
Kerala
Madhya Pradesh
Maharashtra
Manipur
Meghalaya
Mizoram
Nagaland
Odisha
Punjab
Rajasthan
Sikkim
Tamil Nadu
Telangana
Tripura
Uttarakhand
Uttar Pradesh
West Bengal
Andaman and Nicobar Islands
Chandigarh
Dadra and Nagar Haveli and Daman and Diu
Delhi
Lakshadweep
Puducherry
Total

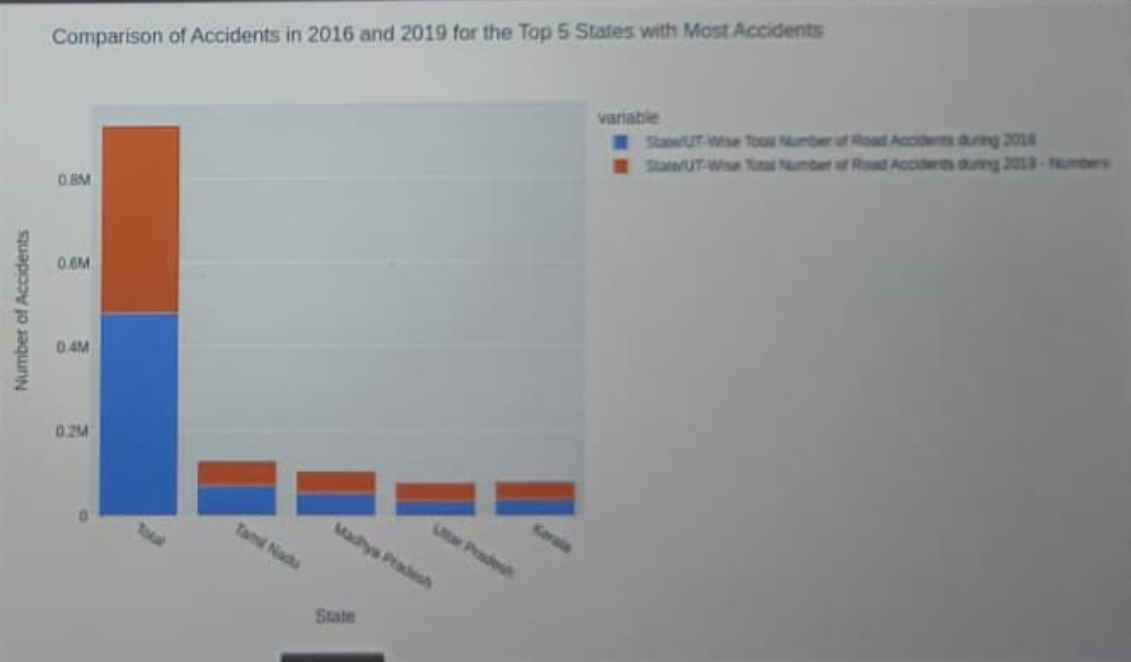

sample_data
RA2019_A2.csv
Disk 81.48 GB available
State
Comparison of Accidents in 2016 and 2019 for the Top 5 States with Most Accidents
Number of Accidents
0.8M
0.6M
0.4M
0.2M
0
variable
State/UT-Wise Total Number of Road Accidents during 2016
State/UT-Wise Total Number of Road Accidents during 2019 - Numbers

Files

..

sample_data

RA2019_A2.csv



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[5]

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[6]

```
       'Share of States/UTs in Total Number of Road Accidents - 2016',
       'Share of States/UTs in Total Number of Road Accidents - 2017',
       'Share of States/UTs in Total Number of Road Accidents - 2018',
       'Share of States/UTs in Total Number of Road Accidents - 2019',
       'Total Number of Accidents Per Lakh Population - 2016',
       'Total Number of Accidents Per Lakh Population - 2017',
       'Total Number of Accidents Per Lakh Population - 2018',
       'Total Number of Accidents Per Lakh Population - 2019',
       'Total Number of  Road Accidents per 10,000 Vehicles - 2016',
       'Total Number of  Road Accidents per 10,000 Vehicles - 2017',
       'Total Number of  Road Accidents per 10,000 Vehicles - 2018',
       'Total Number of  Road Accidents per 10,000 Vehicles - 2019',
       'Total Number of  Road Accidents per 10,000 Km of Roads - 2016',
       'Total Number of  Road Accidents per 10,000 Km of Roads - 2017',
       'Total Number of  Road Accidents per 10,000 Km of Roads - 2018(P)',
       'Total Accidents'],
      dtype='object')
```

```
[7] model.fit(X_train, y_train)
    # Make predictions on the test set
    y_pred = model.predict(X_test)
    # Calculate evaluation metrics
    mse = mean_squared_error(y_test, y_pred)
    mae = mean_absolute_error(y_test, y_pred)
    r2 = r2_score(y_test, y_pred)
    msle = mean_squared_log_error(y_test, y_pred)
    # Display metrics
    print(f"Mean Squared Error: {mse:.2f}")
    print(f"Mean Absolute Error: {mae:.2f}")
    print(f"Mean Squared Logarithmic Error: {msle:.2f}")
    print(f"R-squared: {r2}")
```

```
Mean Squared Error: 0.00
Mean Absolute Error: 0.00
Mean Squared Logarithmic Error: 0.00
R-squared: 1.0
```

Start coding or generate with AI.

```python
# Calculate evaluation metrics
mse = mean_squared_error(y_test, y_pred)
mae = mean_absolute_error(y_test, y_pred)
r2 = r2_score(y_test, y_pred)
msle = mean_squared_log_error(y_test, y_pred)

# Display metrics
print(f"Mean Squared Error: {mse:.2f}")
print(f"Mean Absolute Error: {mae:.2f}")
print(f"Mean Squared Logarithmic Error: {msle:.2f}")
print(f"R-squared: {r2}")
```

```
Mean Squared Error: 0.00
Mean Absolute Error: 0.00
Mean Squared Logarithmic Error: 0.00
R-squared: 1.0
```

Start coding or generate with AI.