```python
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns

# Load dataset (update file path if needed)
df = pd.read_csv('/kaggle/input/data-analytics/CrimesOnWomenData.csv')

# Rename columns for clarity if needed
df.rename(columns={'K&A': 'Kidnap_Abduct', 'DD': 'Dowry_Deaths',
'AoW': 'Assault_Women',
                   'AoM': 'Assault_Minors', 'DV': 'Domestic_Violence',
'WT': 'Trafficking'}, inplace=True)

# Drop unnecessary columns
df.drop(columns=['Unnamed: 0'], inplace=True)

# Handle missing values
df.fillna(0, inplace=True)

# Feature engineering: Total crimes
crime_cols = ['Rape', 'Kidnap_Abduct', 'Dowry_Deaths',
'Assault_Women',
              'Assault_Minors', 'Domestic_Violence', 'Trafficking']
df['Total_Crimes'] = df[crime_cols].sum(axis=1)

# Summary statistics
print(df.describe())

# Visualization 1: Top 10 states by total crimes
top_states = df.groupby('State')
['Total_Crimes'].sum().sort_values(ascending=False).head(10)
top_states.plot(kind='bar', figsize=(10,5), title='Top 10 States by
Total Crimes')
plt.ylabel('Total Crimes'); plt.xticks(rotation=45);
plt.tight_layout(); plt.show()

# Visualization 2: Trend of total crimes by year
yearly_trend = df.groupby('Year')['Total_Crimes'].sum()
yearly_trend.plot(marker='o', figsize=(10,5), title='Crimes Against
Women Over Years')
plt.ylabel('Total Crimes'); plt.grid(True); plt.tight_layout();
plt.show()

# Visualization 3: Heatmap of crime correlations
plt.figure(figsize=(8,6))
sns.heatmap(df[crime_cols + ['Total_Crimes']].corr(), annot=True,
cmap='coolwarm')
plt.title('Correlation Between Crime Types')
plt.tight_layout()
plt.show()
```

```
              Year           Rape   Kidnap_Abduct   Dowry_Deaths
Assault_Women  \
count    736.000000     736.000000      736.000000     736.000000
736.000000
mean    2011.149457     727.855978     1134.542120     215.692935
1579.115489
std        6.053453     977.024945     1993.536828     424.927334
2463.962518
min     2001.000000       0.000000        0.000000       0.000000
0.000000
25%     2006.000000      35.000000       24.750000       1.000000
34.000000
50%     2011.000000     348.500000      290.000000      29.000000
387.500000
75%     2016.000000    1069.000000     1216.000000     259.000000
2122.250000
max     2021.000000    6337.000000    15381.000000    2524.000000
14853.000000

       Assault_Minors   Domestic_Violence   Trafficking   Total_Crimes
count      736.000000          736.000000    736.000000     736.000000
mean       332.722826         2595.078804     28.744565    6613.752717
std        806.024551         4042.004953     79.999660    9056.583832
min          0.000000            0.000000      0.000000       0.000000
25%          3.000000           13.000000      0.000000     146.750000
50%         31.000000          678.500000      0.000000    2632.000000
75%        277.500000         3545.000000     15.000000   10299.000000
max       9422.000000        23278.000000    549.000000   52246.000000
```

## Top 10 States by Total Crimes



## Crimes Against Women Over Years

## Correlation Between Crime Types

| | Rape | Kidnap_Abduct | Dowry_Deaths | Assault_Women | Assault_Minors | Domestic_Violence | Trafficking | Total_Crimes |
|---|---|---|---|---|---|---|---|---|
| **Rape** | 1 | 0.7 | 0.55 | 0.8 | 0.46 | 0.68 | 0.22 | 0.85 |
| **Kidnap_Abduct** | 0.7 | 1 | 0.69 | 0.67 | 0.36 | 0.69 | 0.18 | 0.85 |
| **Dowry_Deaths** | 0.55 | 0.69 | 1 | 0.46 | 0.42 | 0.49 | 0.093 | 0.64 |
| **Assault_Women** | 0.8 | 0.67 | 0.46 | 1 | 0.52 | 0.63 | 0.28 | 0.86 |
| **Assault_Minors** | 0.46 | 0.36 | 0.42 | 0.52 | 1 | 0.42 | 0.26 | 0.57 |
| **Domestic_Violence** | 0.68 | 0.69 | 0.49 | 0.63 | 0.42 | 1 | 0.28 | 0.91 |
| **Trafficking** | 0.22 | 0.18 | 0.093 | 0.28 | 0.26 | 0.28 | 1 | 0.3 |
| **Total_Crimes** | 0.85 | 0.85 | 0.64 | 0.86 | 0.57 | 0.91 | 0.3 | 1 |