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2211cs010353

Prison Population For the Month of April 2023

Description of the Dataset

This dataset analyzes the prison population for April 2023, detailing the total number of inmates, demographic distribution age, gender, and nationality, facility-wise occupancy, and trends in admissions and releases. It also examines crime categories, sentence durations, and any significant changes compared to previous months. The data provides insights into the prison system's capacity, rehabilitation efforts, and policy implications.

```
In [21]: import pandas as pd  
import matplotlib.pyplot as plt  
import seaborn as sns
```

```
In [22]: df = pd.read_csv("Prison_Population_For_the_Month_of_April_2023_0.csv")
```

```
In [23]: print(df.columns)  
  
Index(['Sl. No.', 'Name of the Prison', 'Under Trail Prisoners ',  
       'Convict Prisoners', 'Total'],  
      dtype='object')
```

```
In [24]: df
```

Out[24]:

| | Sl. No. | Name of the Prison | Under Trail Prisoners | Convict Prisoners | Total |
|-----------|---------|----------------------------------|-----------------------|-------------------|--------|
| 0 | 1 | Central Prison, Bengaluru | 4280.0 | 1129.0 | 5409.0 |
| 1 | 2 | Open Prison, Devanahalli | 0.0 | 48.0 | 48.0 |
| 2 | 3 | District Prison, Ramanagara | 303.0 | 1.0 | 304.0 |
| 3 | 4 | District Prison, Kolar | 148.0 | 2.0 | 150.0 |
| 4 | 5 | Taluka Prison, K.G.F. | 79.0 | 0.0 | 79.0 |
| 5 | 6 | District Prison, Tumakuru | 427.0 | 6.0 | 433.0 |
| 6 | 7 | Taluka Prison, Tiptur | 0.0 | 0.0 | 0.0 |
| 7 | 8 | District Prison, Chikkaballapura | 228.0 | 1.0 | 229.0 |
| 8 | 9 | Taluka Prison, Chinthamani | 76.0 | 0.0 | 76.0 |
| 9 | 10 | Central Prison, Mysuru | 456.0 | 439.0 | 895.0 |
| 10 | 11 | Taluka Prison, K.R. Nagar | 76.0 | 0.0 | 76.0 |
| 11 | 12 | Taluka Prison, Nanjangud | 41.0 | 0.0 | 41.0 |
| 12 | 13 | District Prison, Chamarajnagar | 157.0 | 2.0 | 159.0 |
| 13 | 14 | District Prison, Mandya | 355.0 | 1.0 | 356.0 |
| 14 | 15 | District Prison, Hassan | 320.0 | 3.0 | 323.0 |
| 15 | 16 | Taluka Prison, Sakaleshpur | 55.0 | 0.0 | 55.0 |
| 16 | 17 | District Prison, Madikeri | 204.0 | 3.0 | 207.0 |
| 17 | 18 | Central Prison, Shivamogga | 315.0 | 374.0 | 689.0 |
| 18 | 19 | Women Central Prison, Shivamogga | 39.0 | 33.0 | 72.0 |
| 19 | 20 | Taluka Prison, Sagara | 19.0 | 0.0 | 19.0 |
| 20 | 21 | District Prison, Mangaluru | 369.0 | 7.0 | 376.0 |
| 21 | 22 | District Prison, Chikkamagaluru | 247.0 | 3.0 | 250.0 |
| 22 | 23 | District Prison, Udupi | 134.0 | 3.0 | 137.0 |
| 23 | 24 | District Prison, Davangere | 238.0 | 8.0 | 246.0 |
| 24 | 25 | District Prison, Chitradurga | 208.0 | 2.0 | 210.0 |
| 25 | 26 | Central Prison, Belagavi | 462.0 | 446.0 | 908.0 |
| 26 | 27 | Taluka Prison, Gokak | 79.0 | 1.0 | 80.0 |
| 27 | 28 | Taluka Prison, Bailahongala | 23.0 | 0.0 | 23.0 |
| 28 | 29 | District Prison, Karwar | 121.0 | 1.0 | 122.0 |

| Sl. No. | | Name of the Prison | Under Trail Prisoners | Convict Prisoners | Total |
|---------|-------|-------------------------------|-----------------------|-------------------|----------------|
| 29 | 30 | Taluka Prison, Haliyala | 19.0 | 1.0 | 20.0 |
| 30 | 31 | CENTRAL PRISON, DHARWAD | 317.0 | 267.0 | 584.0 |
| 31 | 32 | Taluka Prison, Hubballi | 116.0 | 0.0 | 116.0 |
| 32 | 33 | District Prison, Haveri | 139.0 | 7.0 | 146.0 |
| 33 | 34 | District Prison, Gadag | 142.0 | 5.0 | 147.0 |
| 34 | 35 | CENTRAL PRISON, VIJAYAPURA | 332.0 | 246.0 | 578.0 |
| 35 | 36 | District Prison, Bagalkote | 142.0 | 5.0 | 147.0 |
| 36 | 37 | Taluka Prison, Jamkhandi | 79.0 | 1.0 | 80.0 |
| 37 | 38 | CENTRAL PRISON, KALABURGI | 620.0 | 345.0 | 965.0 |
| 38 | 39 | District Prison, Yadgiri | 110.0 | 0.0 | 110.0 |
| 39 | 40 | Taluka Prison, Shorapur | 42.0 | 1.0 | 43.0 |
| 40 | 41 | District Prison, Bidar | 172.0 | 1.0 | 173.0 |
| 41 | 42 | Taluka Prison, Aurad | 15.0 | 0.0 | 15.0 |
| 42 | 43 | Taluka Prison, Humnabad | 118.0 | 1.0 | 119.0 |
| 43 | 44 | CENTRAL PRISON, BALLARI | 279.0 | 256.0 | 535.0 |
| 44 | 45 | Taluka Prison, Hosapete | 63.0 | 0.0 | 63.0 |
| 45 | 46 | Taluka Prison, Hadagali | 24.0 | 0.0 | 24.0 |
| 46 | 47 | Taluka Prison, Harappanahalli | 79.0 | 0.0 | 79.0 |
| 47 | 48 | District Prison, Raichur | 190.0 | 29.0 | 219.0 |
| 48 | 49 | Taluka Prison, Devadurga | 5.0 | 0.0 | 5.0 |
| 49 | 50 | Taluka Prison, Lingasugur | 20.0 | 1.0 | 21.0 |
| 50 | 51 | District Prison, Koppal | 200.0 | 8.0 | 208.0 |
| 51 | 52 | Revenue Prison, Sirsi | 11.0 | 0.0 | 11.0 |
| 52 | 53 | Revenue Prison, Sedam | 71.0 | 0.0 | 71.0 |
| 53 | 54 | Revenue Prison, Madhugiri | 56.0 | 0.0 | 56.0 |
| 54 | Total | | NaN | 12820.0 | 3687.0 16507.0 |
| 55 | NaN | | NaN | NaN | NaN |

```
In [25]: df_cleaned = df.dropna().copy()
```

```
In [26]: df.columns = df.columns.str.strip()
```

```
In [27]: sns.set_style("whitegrid")
```

```
In [28]: df_cleaned.head()
```

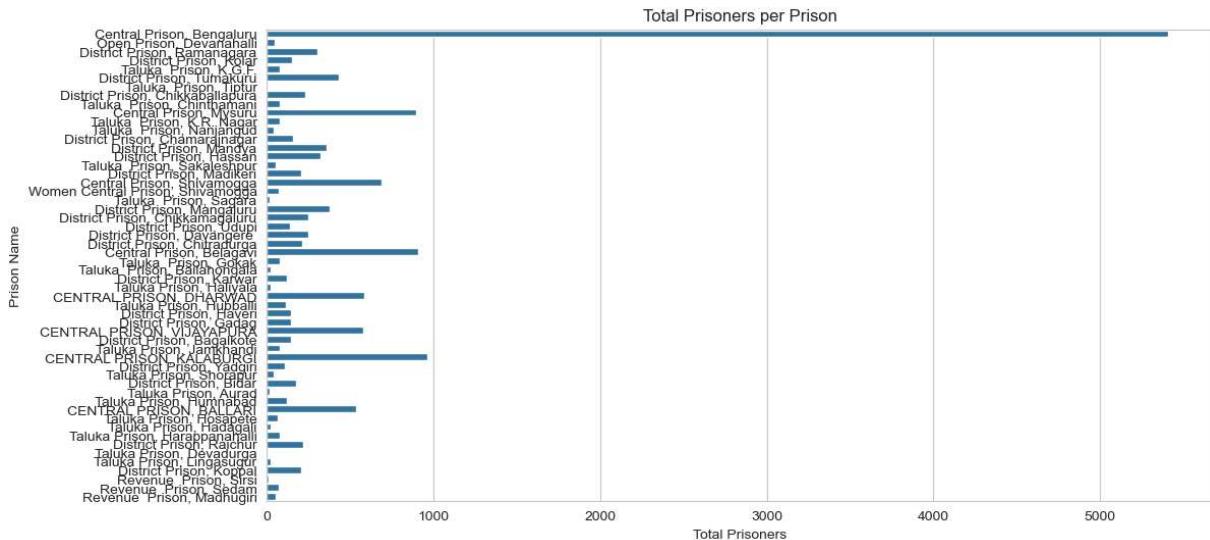
Out[28]:

| | Sl. No. | Name of the Prison | Under Trail Prisoners | Convict Prisoners | Total |
|---|---------|-----------------------------|-----------------------|-------------------|--------|
| 0 | 1 | Central Prison, Bengaluru | 4280.0 | 1129.0 | 5409.0 |
| 1 | 2 | Open Prison, Devanahalli | 0.0 | 48.0 | 48.0 |
| 2 | 3 | District Prison, Ramanagara | 303.0 | 1.0 | 304.0 |
| 3 | 4 | District Prison, Kolar | 148.0 | 2.0 | 150.0 |
| 4 | 5 | Taluka Prison, K.G.F. | 79.0 | 0.0 | 79.0 |

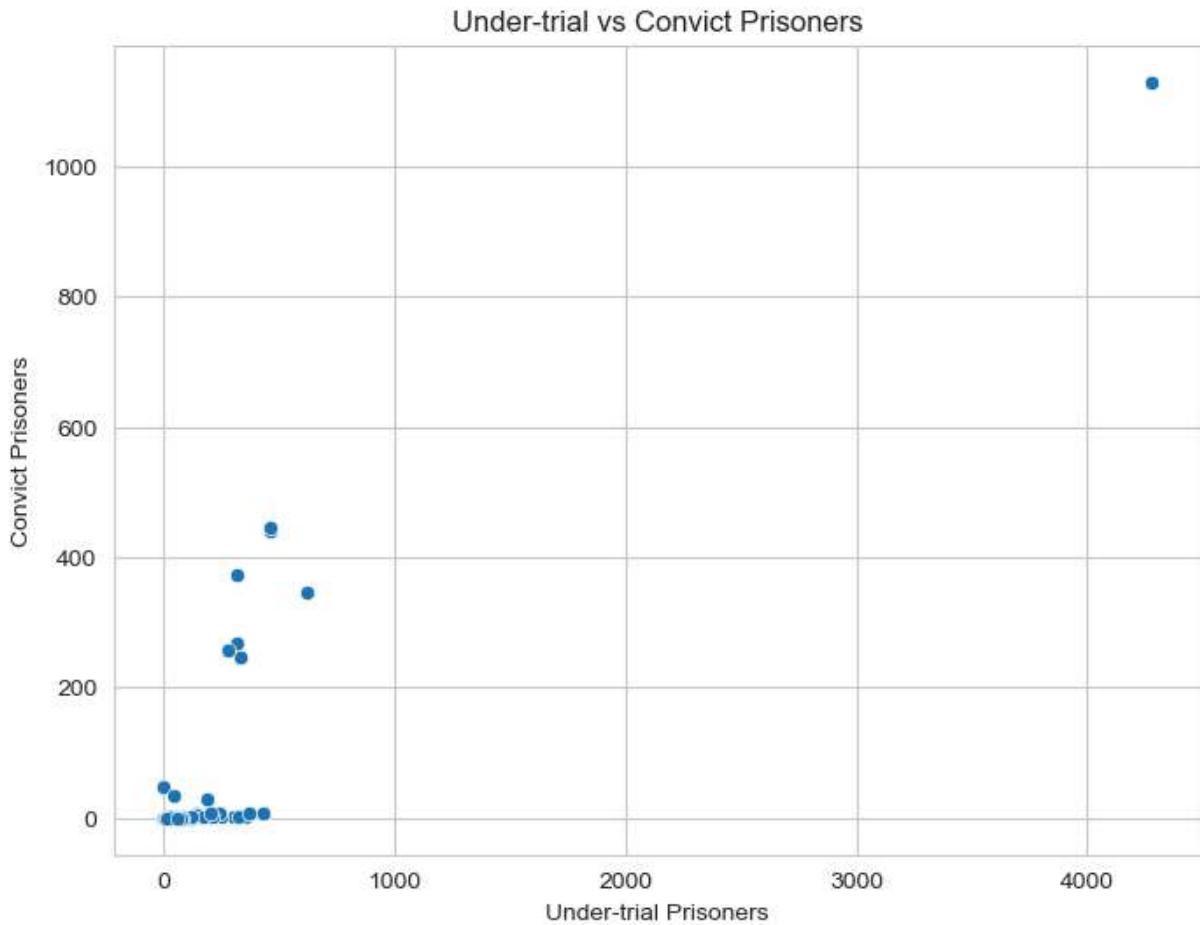
```
In [29]: print(df.columns.tolist())
```

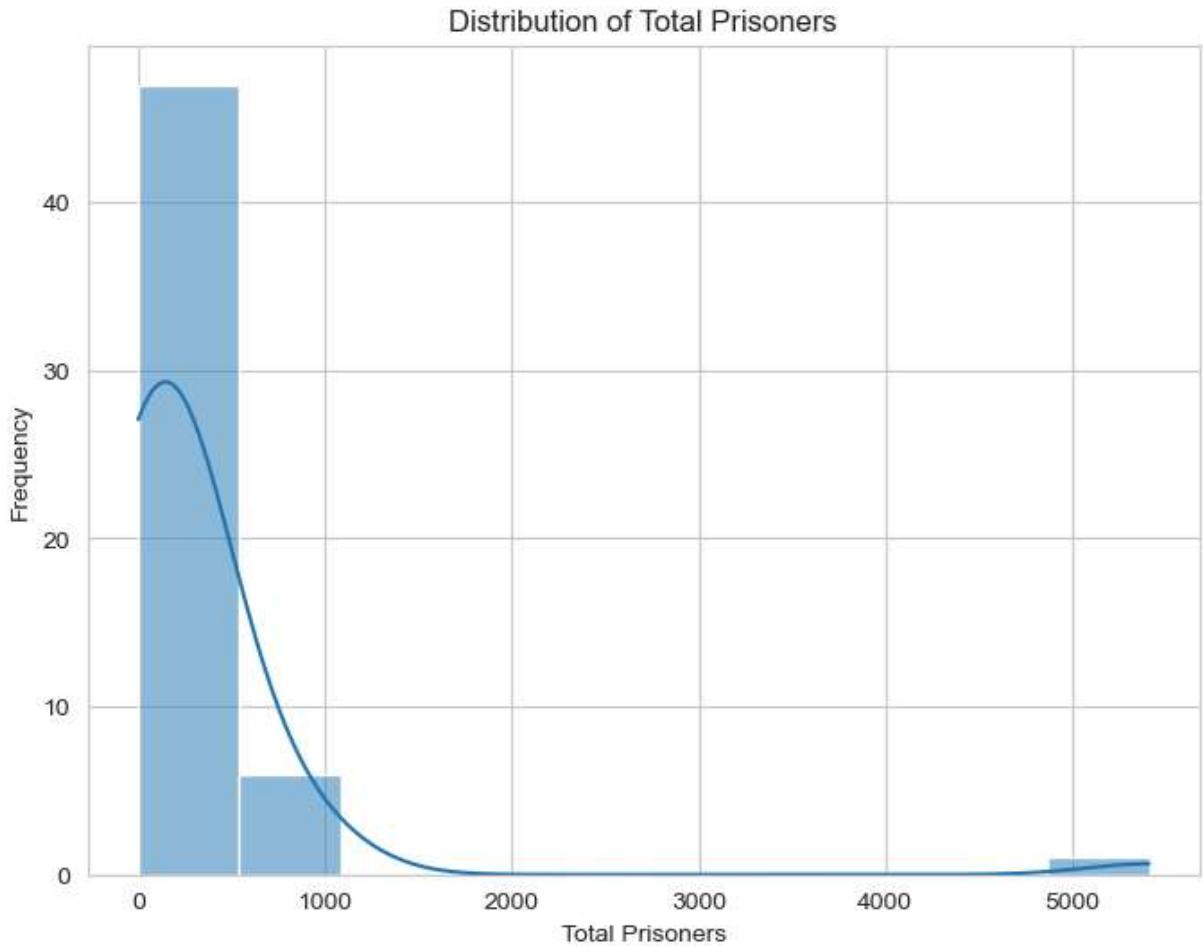
```
['Sl. No.', 'Name of the Prison', 'Under Trail Prisoners', 'Convict Prisoners', 'Total']
```

```
In [31]: plt.figure(figsize=(12, 6))
sns.barplot(data=df_cleaned, x="Total", y="Name of the Prison")
plt.title("Total Prisoners per Prison")
plt.xlabel("Total Prisoners")
plt.ylabel("Prison Name")
plt.show()
```



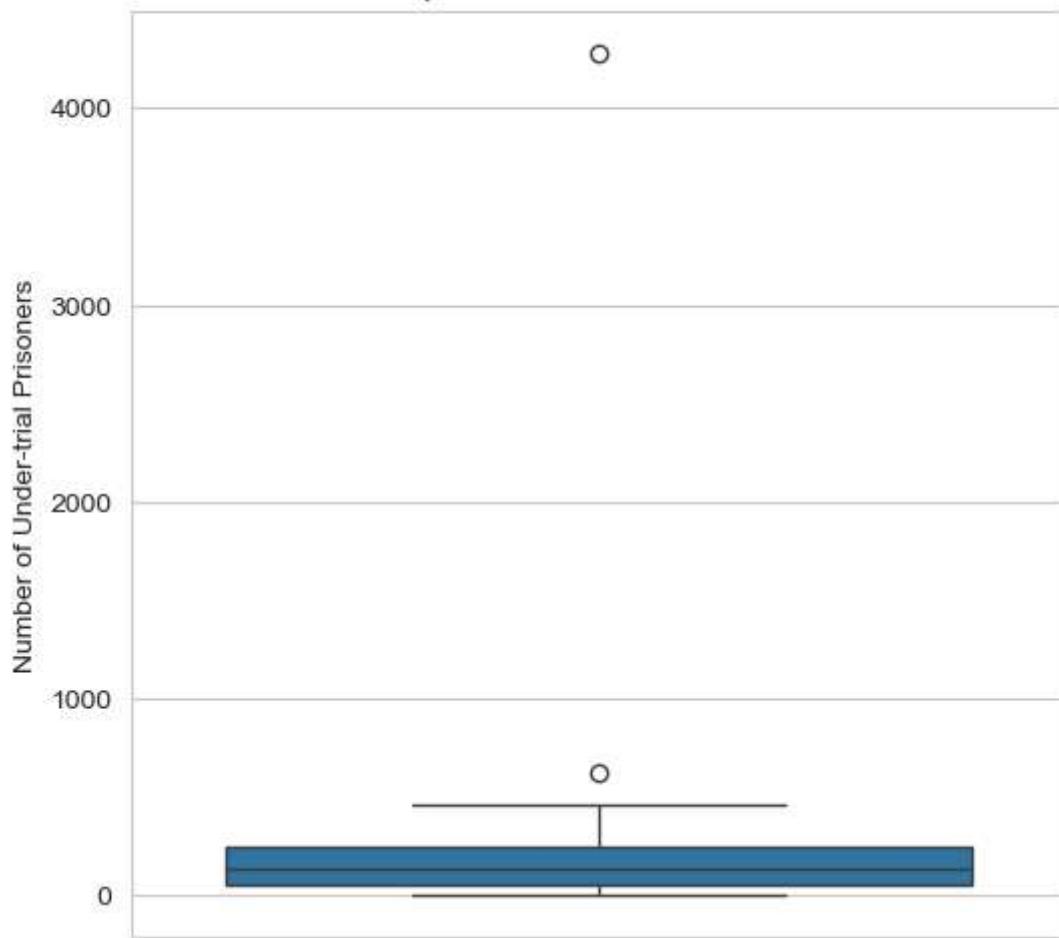
```
In [37]: plt.figure(figsize=(8, 6))
sns.scatterplot(data=df_cleaned, x="Under Trail Prisoners ", y="Convict Prisoners")
plt.title("Under-trial vs Convict Prisoners")
plt.xlabel("Under-trial Prisoners")
plt.ylabel("Convict Prisoners")
plt.show()
```



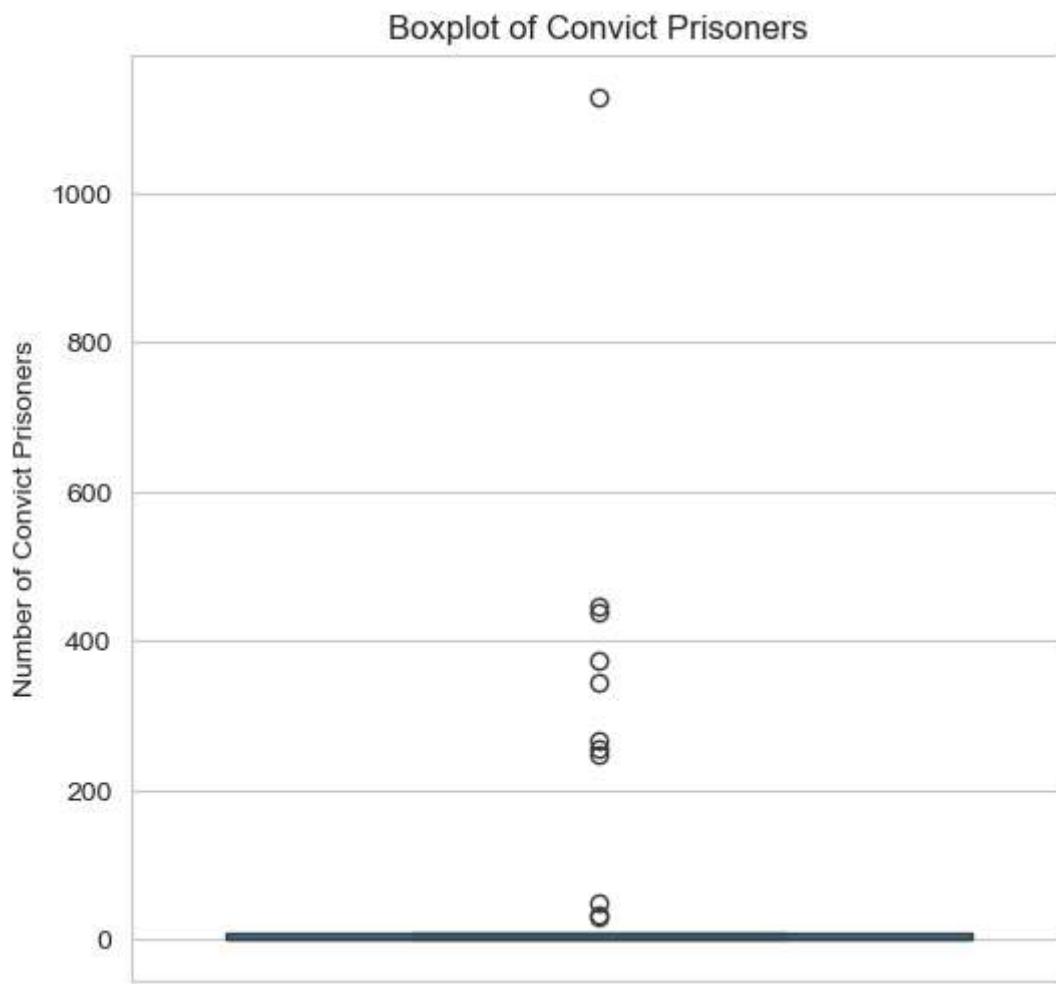


```
In [36]: plt.figure(figsize=(6, 6))
sns.boxplot(y=df_cleaned["Under Trail Prisoners"])
plt.title("Boxplot of Under-trial Prisoners")
plt.ylabel("Number of Under-trial Prisoners")
plt.show()
```

Boxplot of Under-trial Prisoners

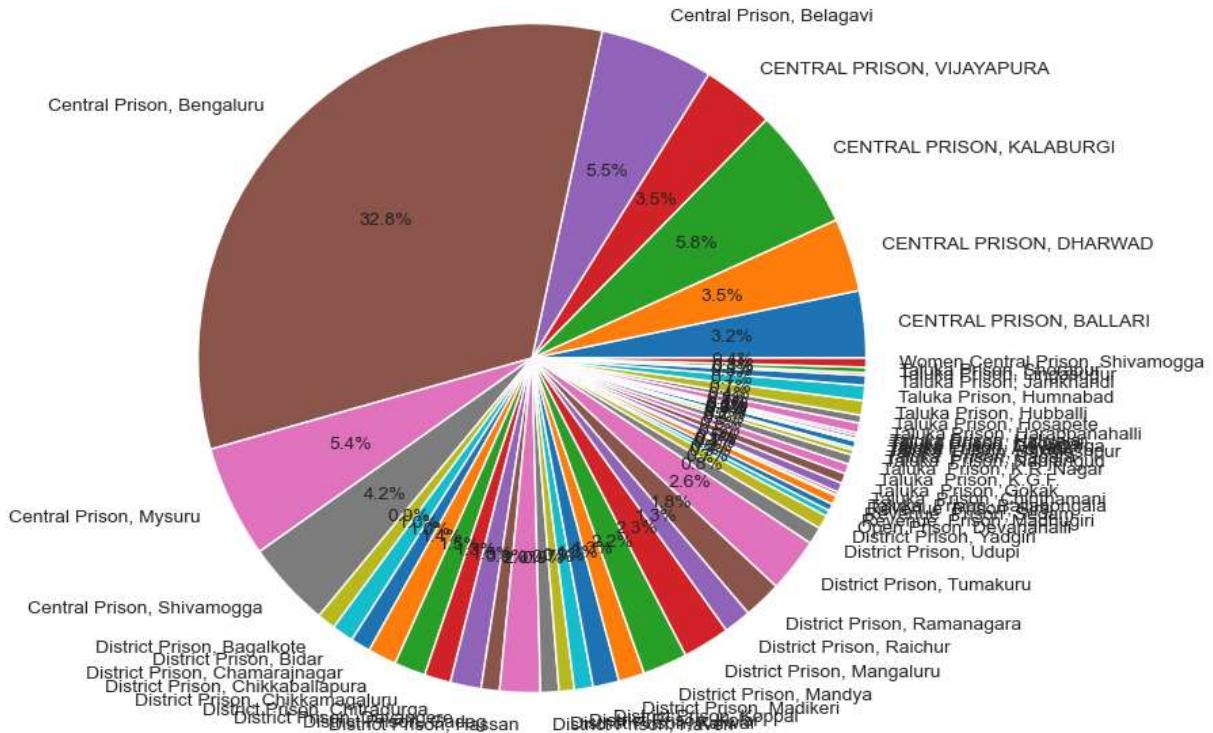


```
In [38]: plt.figure(figsize=(6, 6))
sns.boxplot(y=df_cleaned["Convict Prisoners"])
plt.title("Boxplot of Convict Prisoners")
plt.ylabel("Number of Convict Prisoners")
plt.show()
```

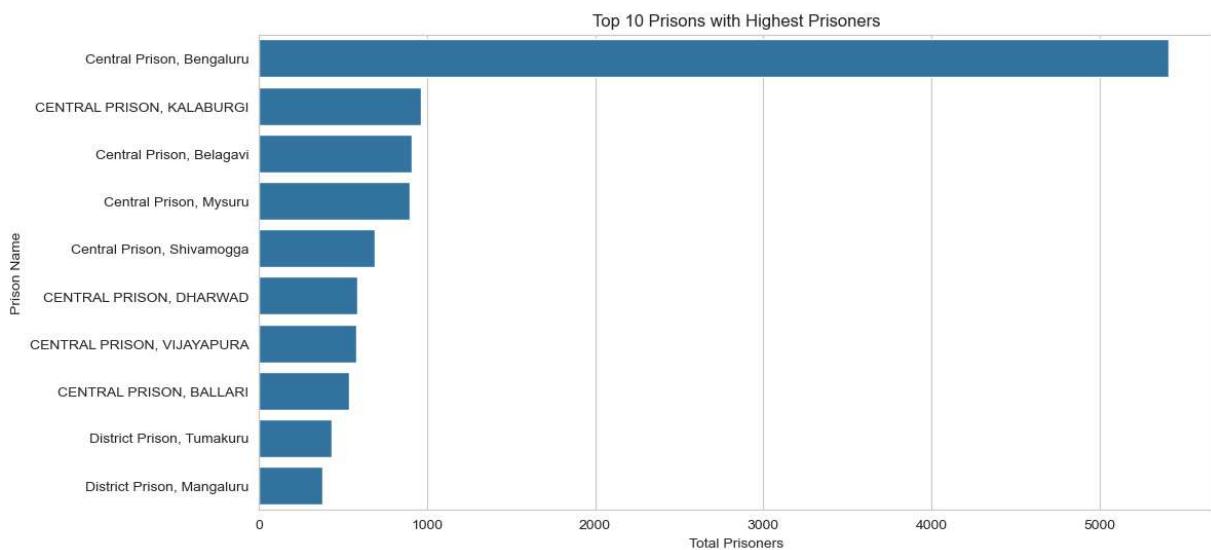


```
In [39]: plt.figure(figsize=(8, 8))
df_cleaned.groupby("Name of the Prison")["Total"].sum().plot.pie(autopct='%1.1f%%')
plt.title("Total Prisoners Distribution")
plt.ylabel("")
plt.show()
```

Total Prisoners Distribution

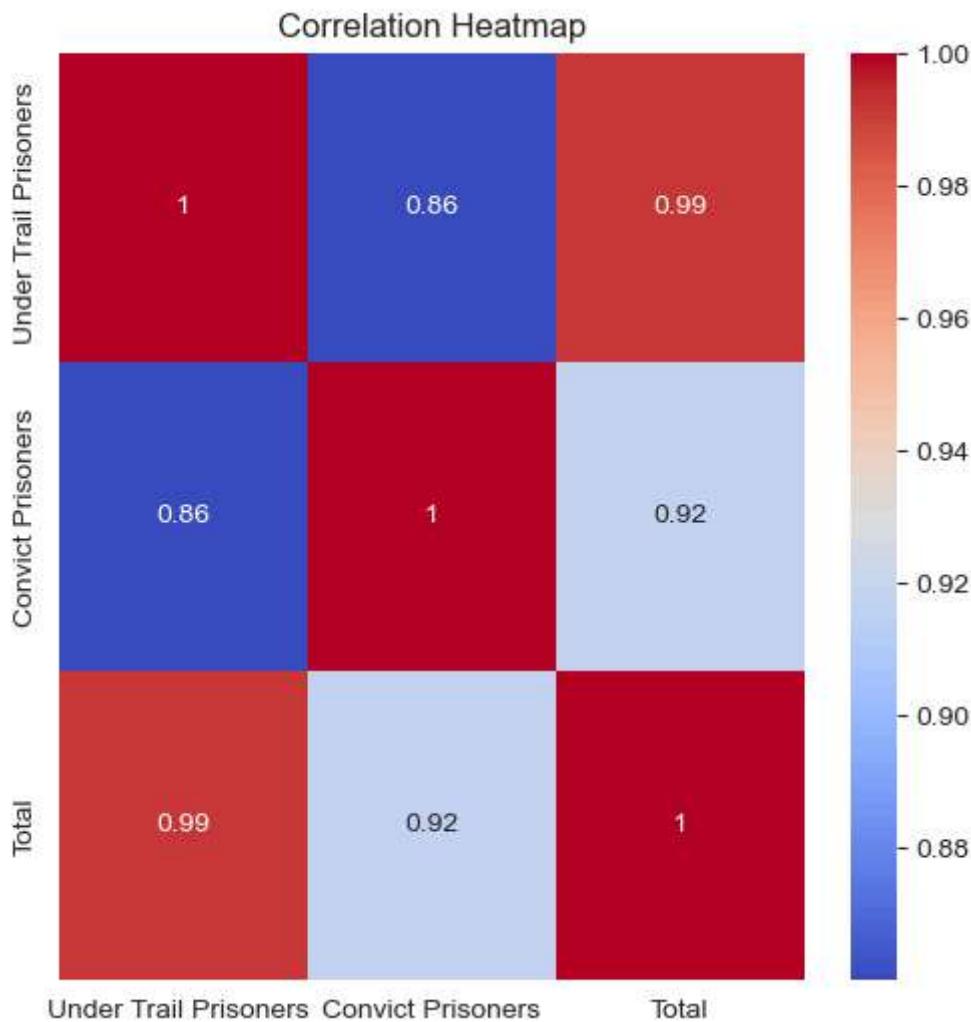


```
In [40]: top_10_prisons = df_cleaned nlargest(10, "Total")
plt.figure(figsize=(12, 6))
sns.barplot(data=top_10_prisons, x="Total", y="Name of the Prison")
plt.title("Top 10 Prisons with Highest Prisoners")
plt.xlabel("Total Prisoners")
plt.ylabel("Prison Name")
plt.show()
```



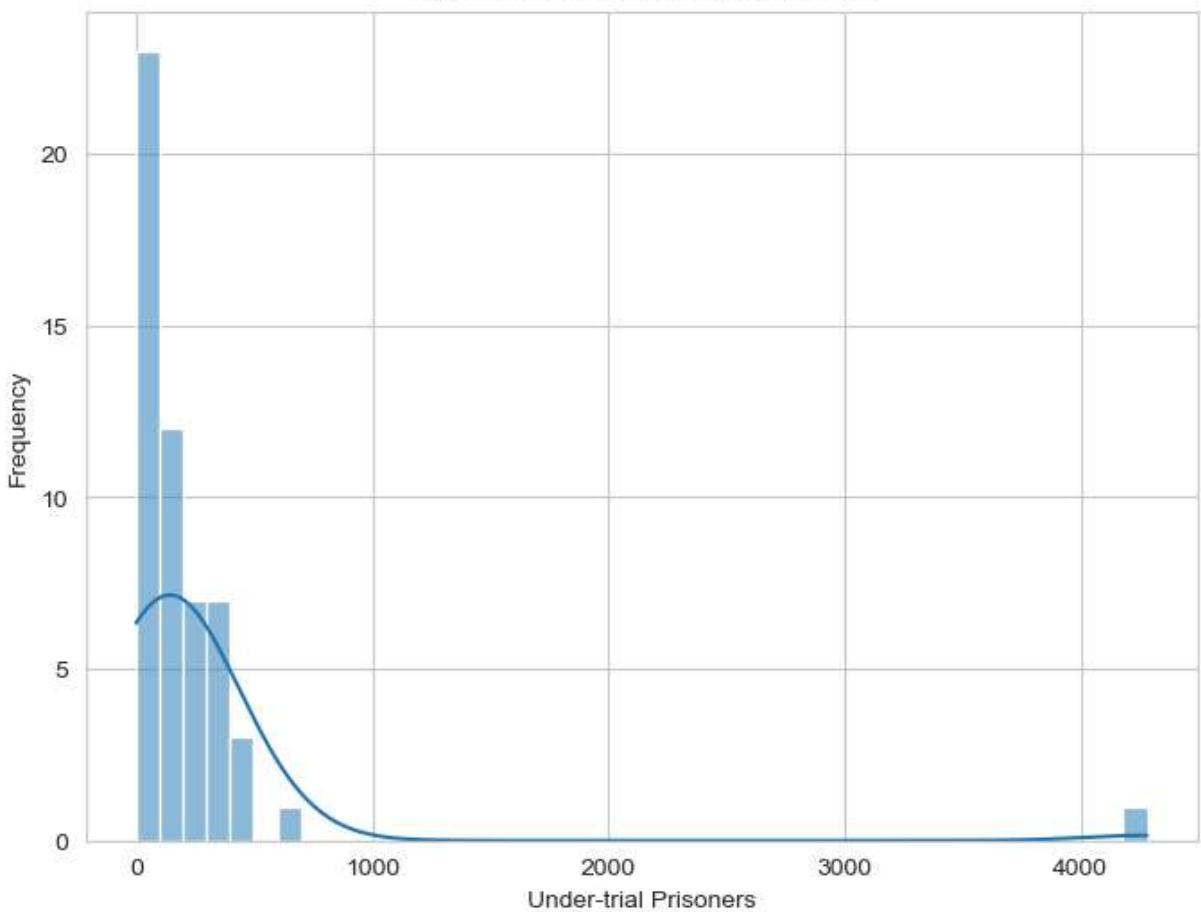
```
In [41]: plt.figure(figsize=(6, 6))
sns.heatmap(df_cleaned[["Under Trail Prisoners ", "Convict Prisoners", "Total"]].co
```

```
plt.title("Correlation Heatmap")
plt.show()
```

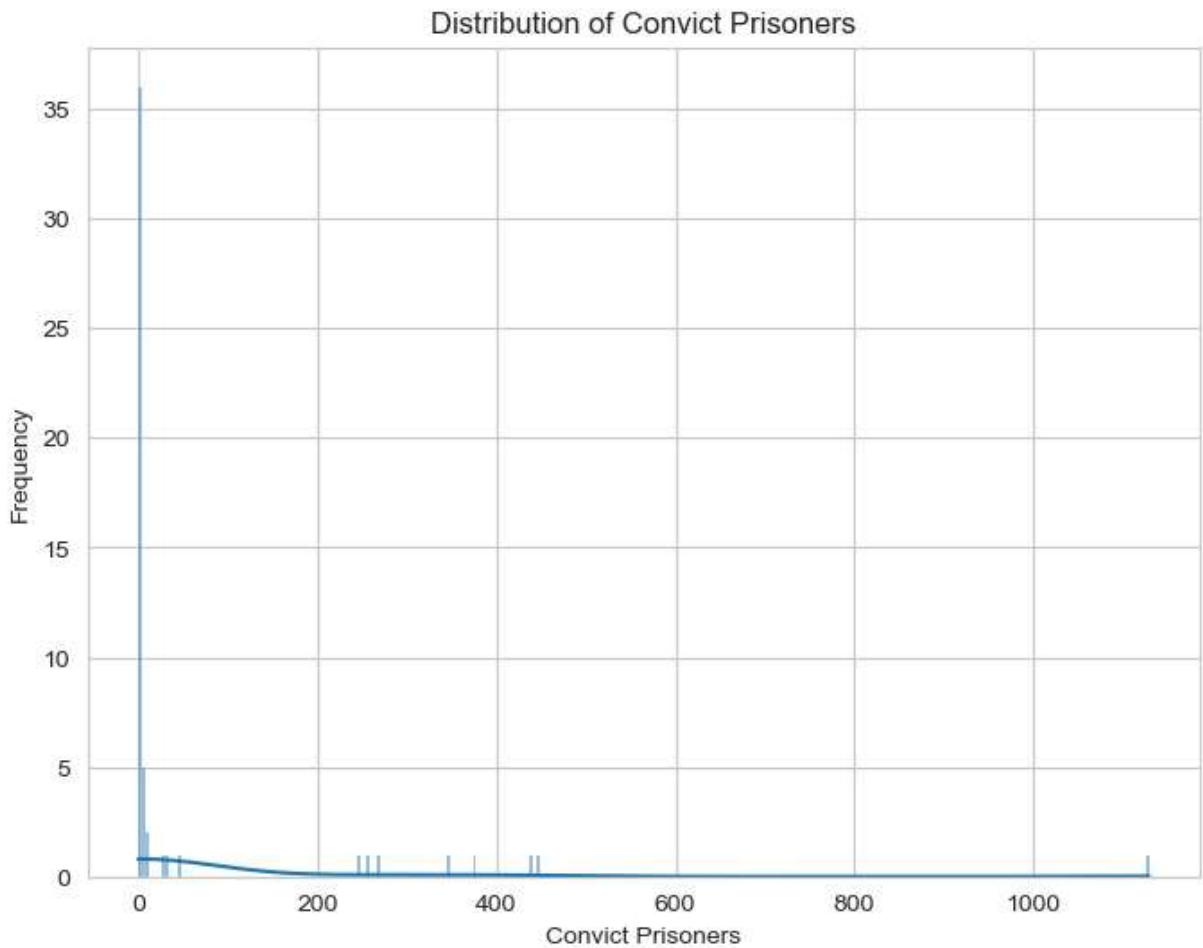


```
In [42]: plt.figure(figsize=(8, 6))
sns.histplot(df_cleaned["Under Trail Prisoners"], kde=True)
plt.title("Distribution of Under-trial Prisoners")
plt.xlabel("Under-trial Prisoners")
plt.ylabel("Frequency")
plt.show()
```

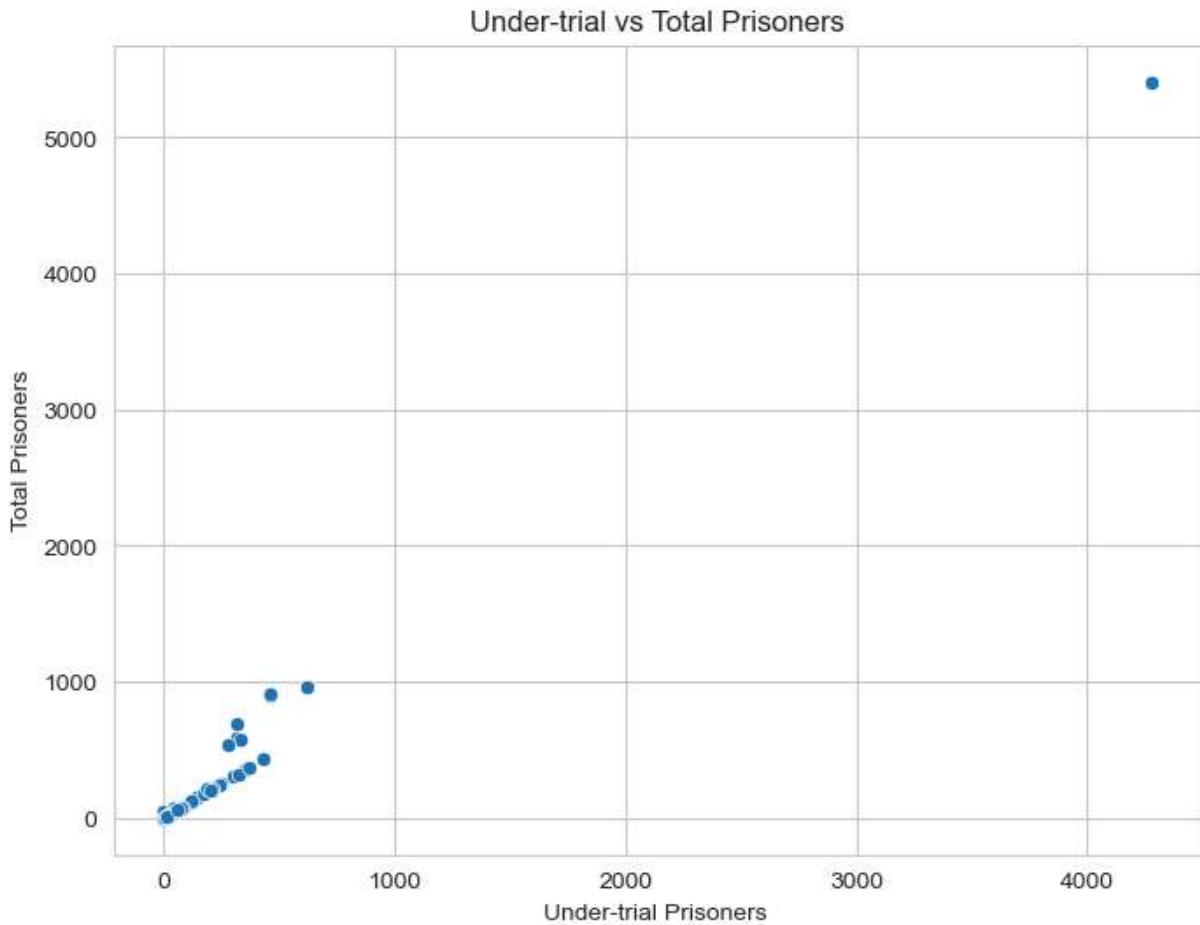
Distribution of Under-trial Prisoners



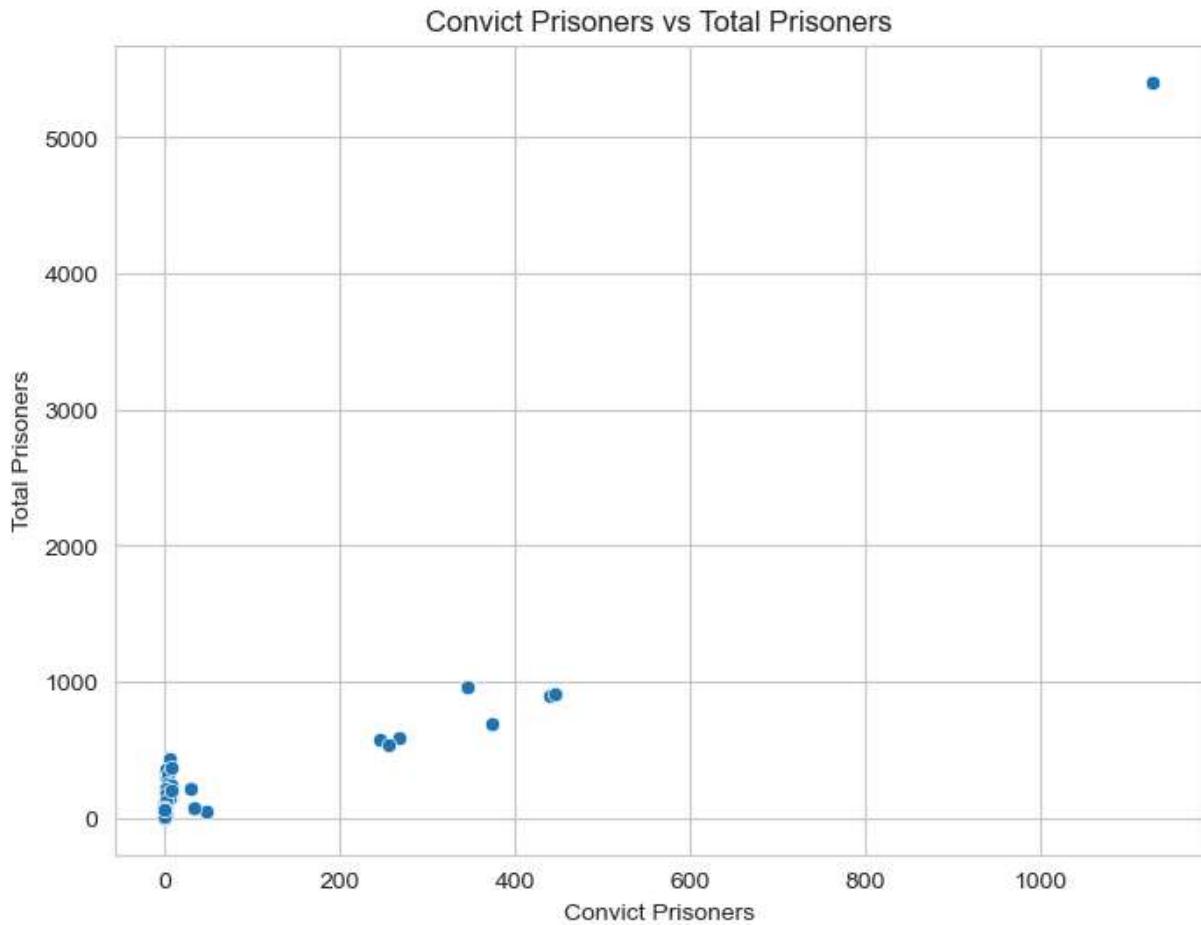
```
In [43]: plt.figure(figsize=(8, 6))
sns.histplot(df_cleaned["Convict Prisoners"], kde=True)
plt.title("Distribution of Convict Prisoners")
plt.xlabel("Convict Prisoners")
plt.ylabel("Frequency")
plt.show()
```



```
In [44]: plt.figure(figsize=(8, 6))
sns.scatterplot(data=df_cleaned, x="Under Trail Prisoners ", y="Total")
plt.title("Under-trial vs Total Prisoners")
plt.xlabel("Under-trial Prisoners ")
plt.ylabel("Total Prisoners")
plt.show()
```

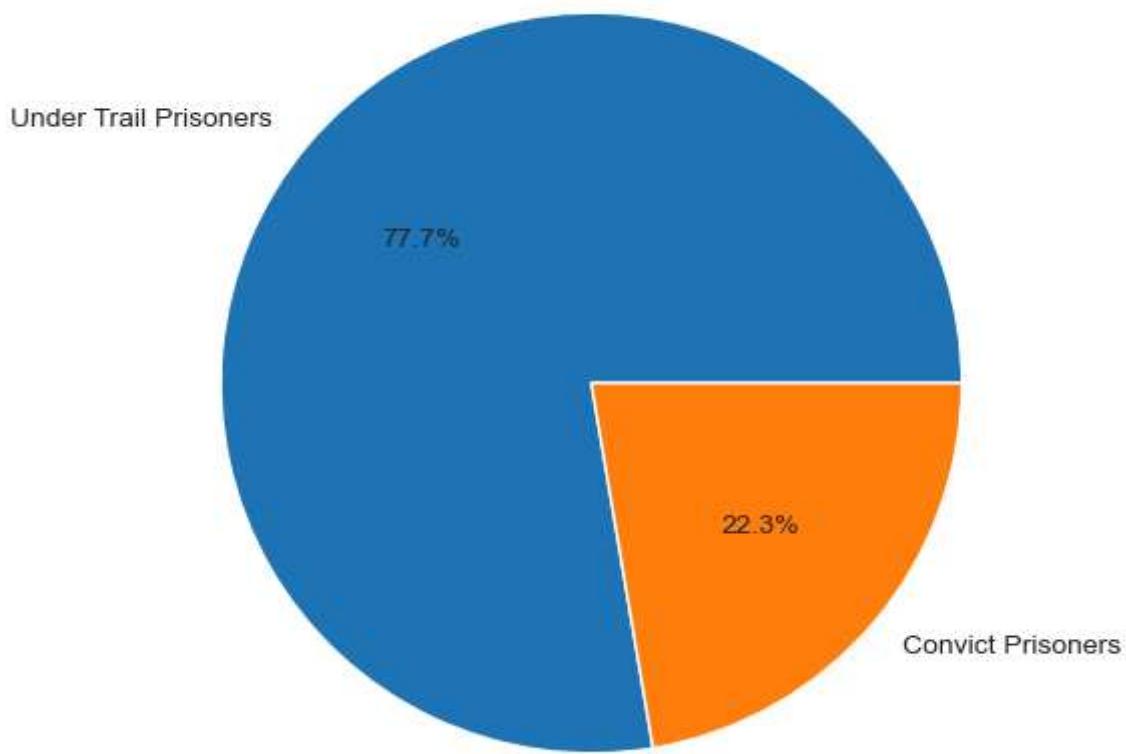


```
In [45]: plt.figure(figsize=(8, 6))
sns.scatterplot(data=df_cleaned, x="Convict Prisoners", y="Total")
plt.title("Convict Prisoners vs Total Prisoners")
plt.xlabel("Convict Prisoners")
plt.ylabel("Total Prisoners")
plt.show()
```



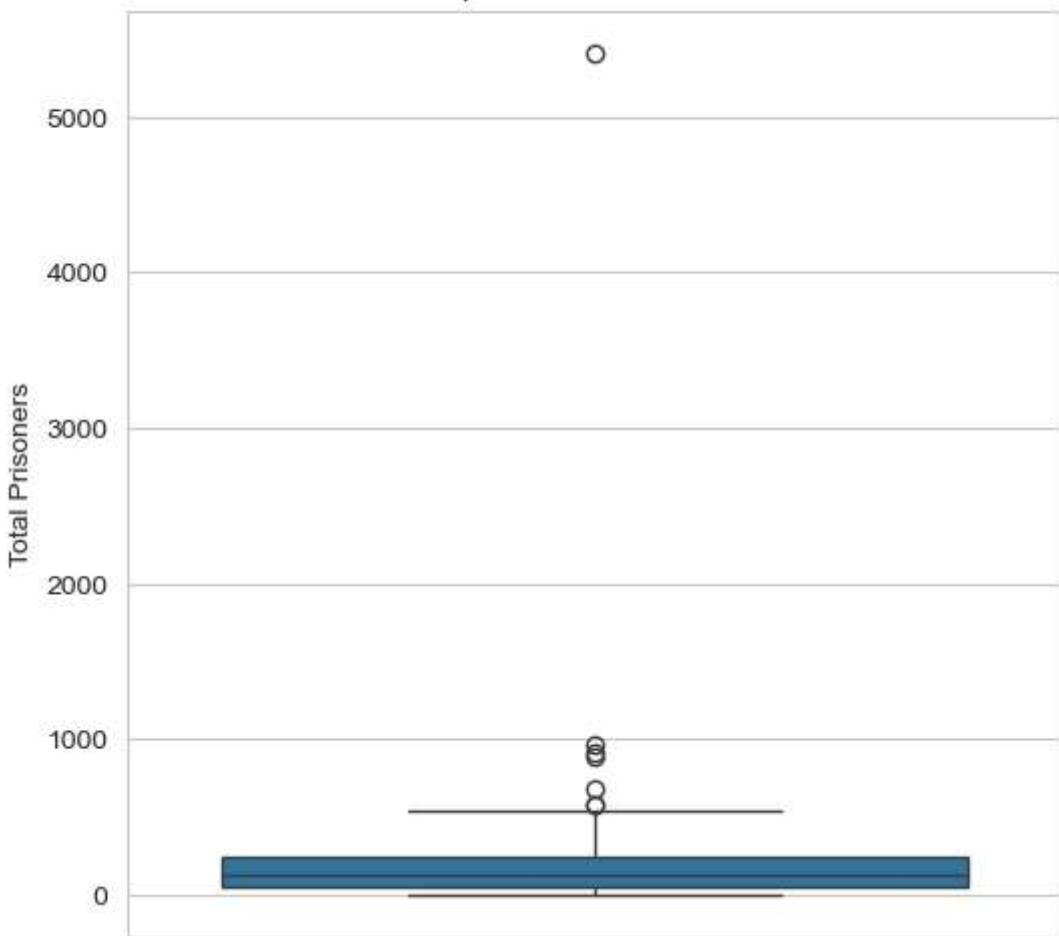
```
In [46]: plt.figure(figsize=(6, 6))
df_cleaned[["Under Trail Prisoners ", "Convict Prisoners"]].sum().plot.pie(autopct=
plt.title("Under-trial vs Convict Prisoners Percentage")
plt.ylabel("")
plt.show()
```

Under-trial vs Convict Prisoners Percentage

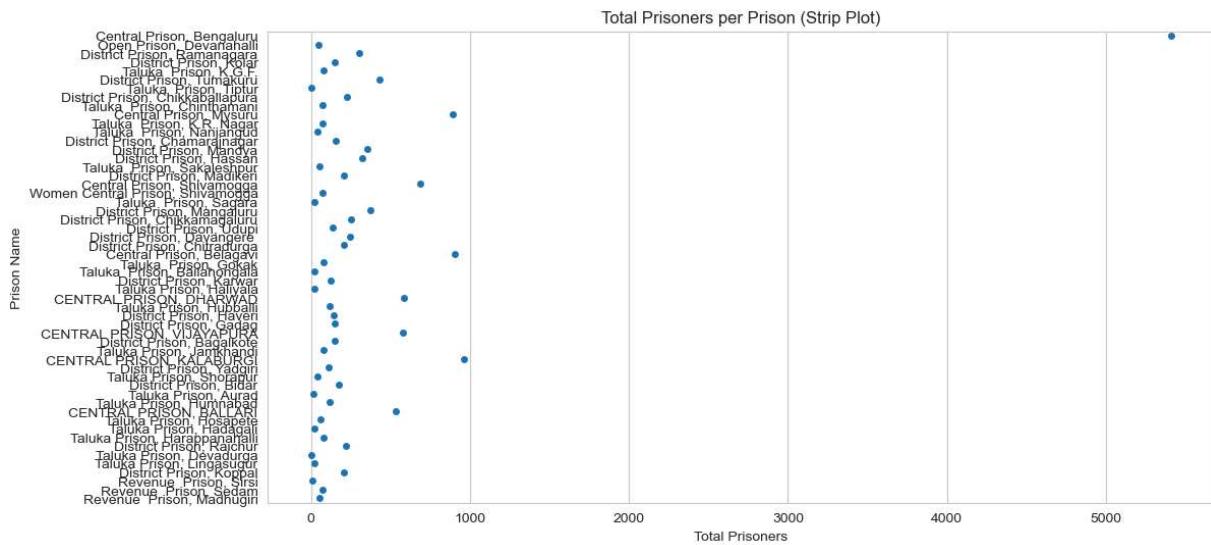


```
In [47]: plt.figure(figsize=(6, 6))
sns.boxplot(y=df_cleaned["Total"])
plt.title("Boxplot of Total Prisoners")
plt.ylabel("Total Prisoners")
plt.show()
```

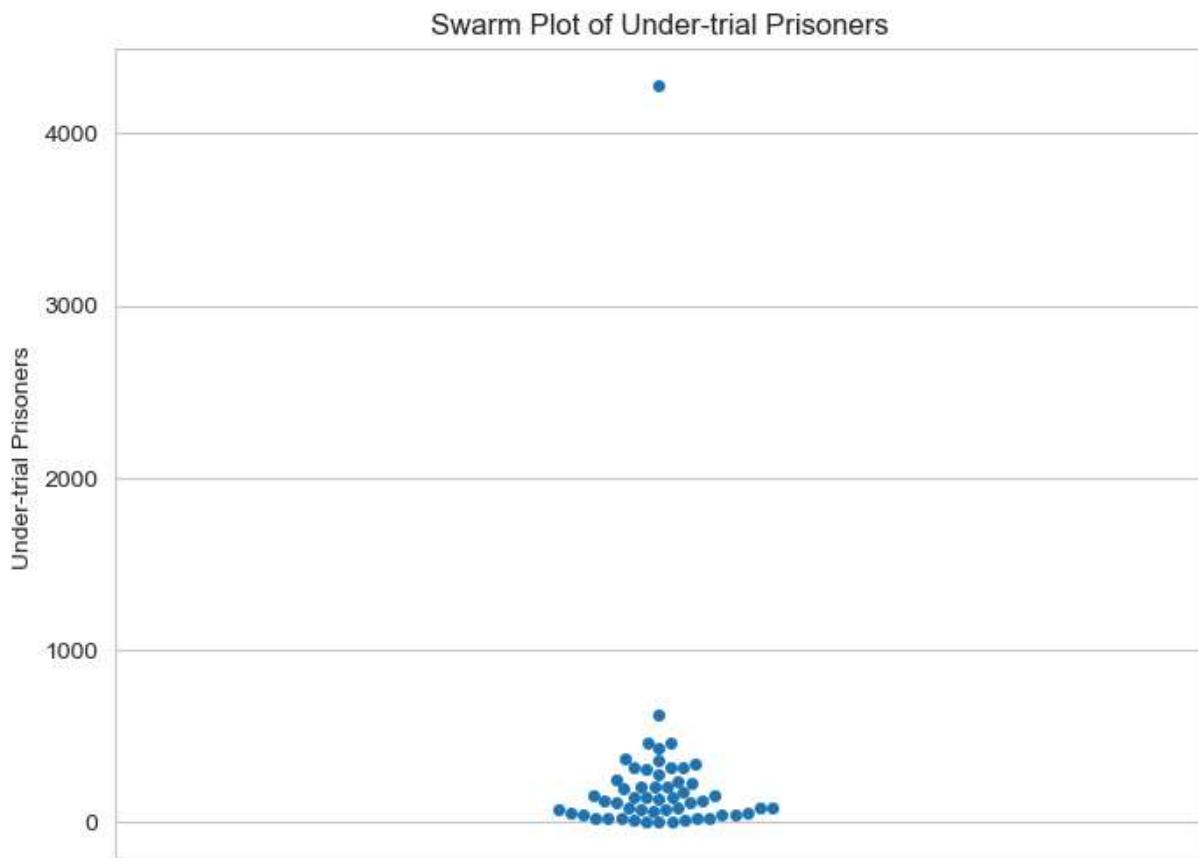
Boxplot of Total Prisoners



```
In [48]: plt.figure(figsize=(12, 6))
sns.stripplot(data=df_cleaned, x="Total", y="Name of the Prison", jitter=True)
plt.title("Total Prisoners per Prison (Strip Plot)")
plt.xlabel("Total Prisoners")
plt.ylabel("Prison Name")
plt.show()
```

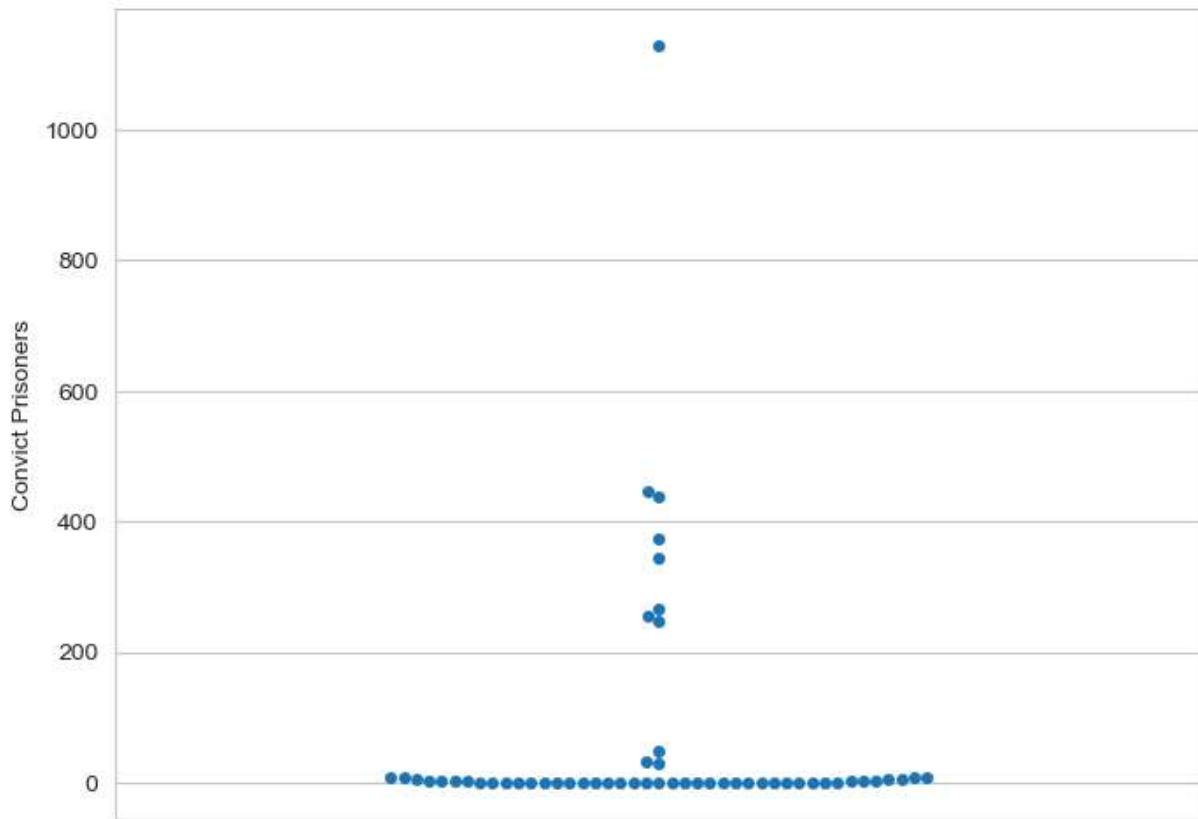


```
In [49]: plt.figure(figsize=(8, 6))
sns.swarmplot(y=df_cleaned["Under Trail Prisoners"])
plt.title("Swarm Plot of Under-trial Prisoners")
plt.ylabel("Under-trial Prisoners")
plt.show()
```

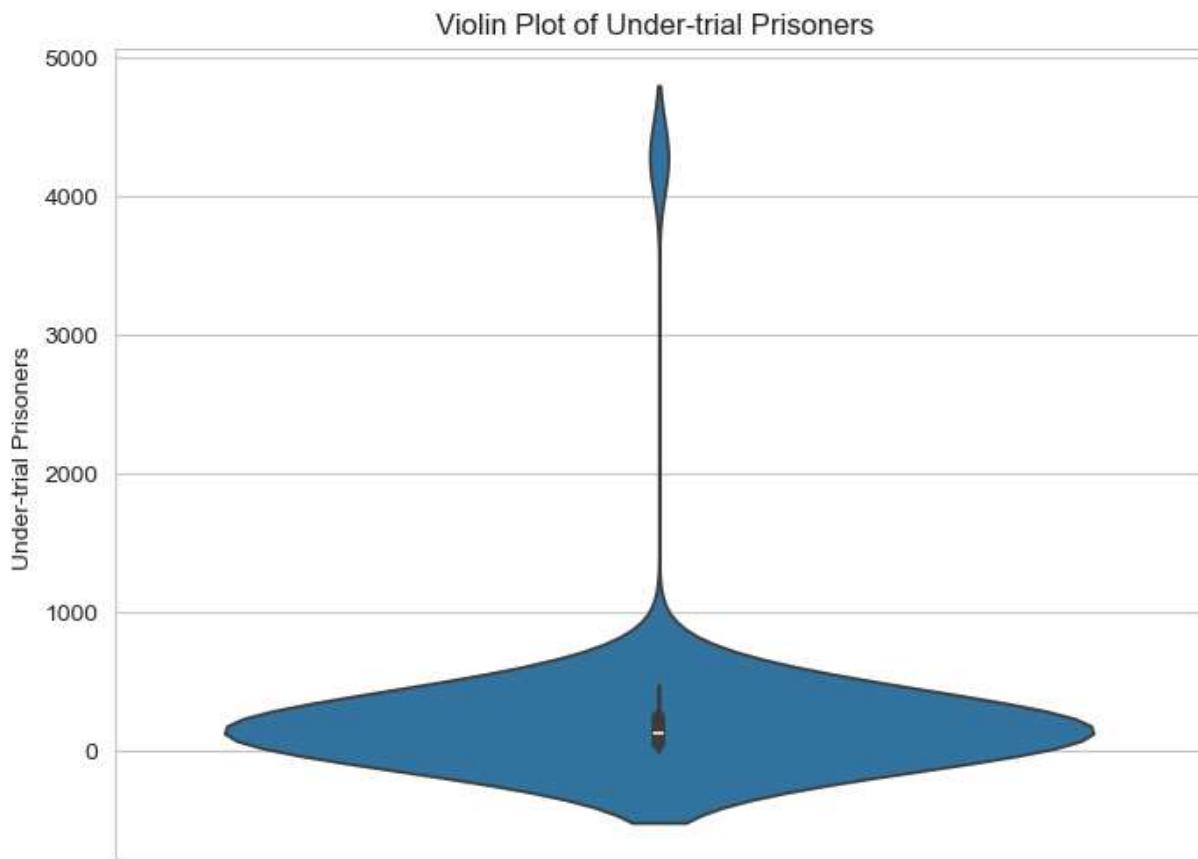


```
In [50]: plt.figure(figsize=(8, 6))
sns.swarmplot(y=df_cleaned["Convict Prisoners"])
plt.title("Swarm Plot of Convict Prisoners")
plt.ylabel("Convict Prisoners")
plt.show()
```

Swarm Plot of Convict Prisoners

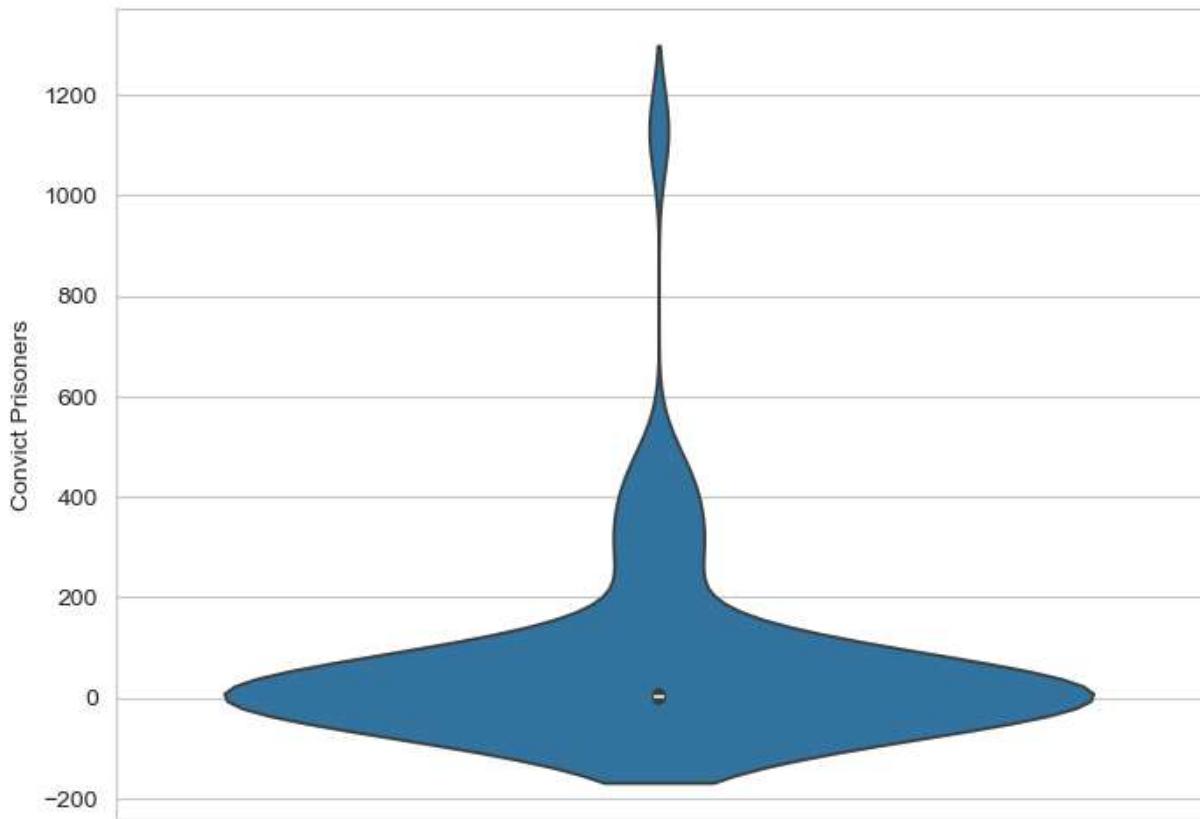


```
In [51]: plt.figure(figsize=(8, 6))
sns.violinplot(y=df_cleaned["Under Trail Prisoners "])
plt.title("Violin Plot of Under-trial Prisoners ")
plt.ylabel("Under-trial Prisoners ")
plt.show()
```

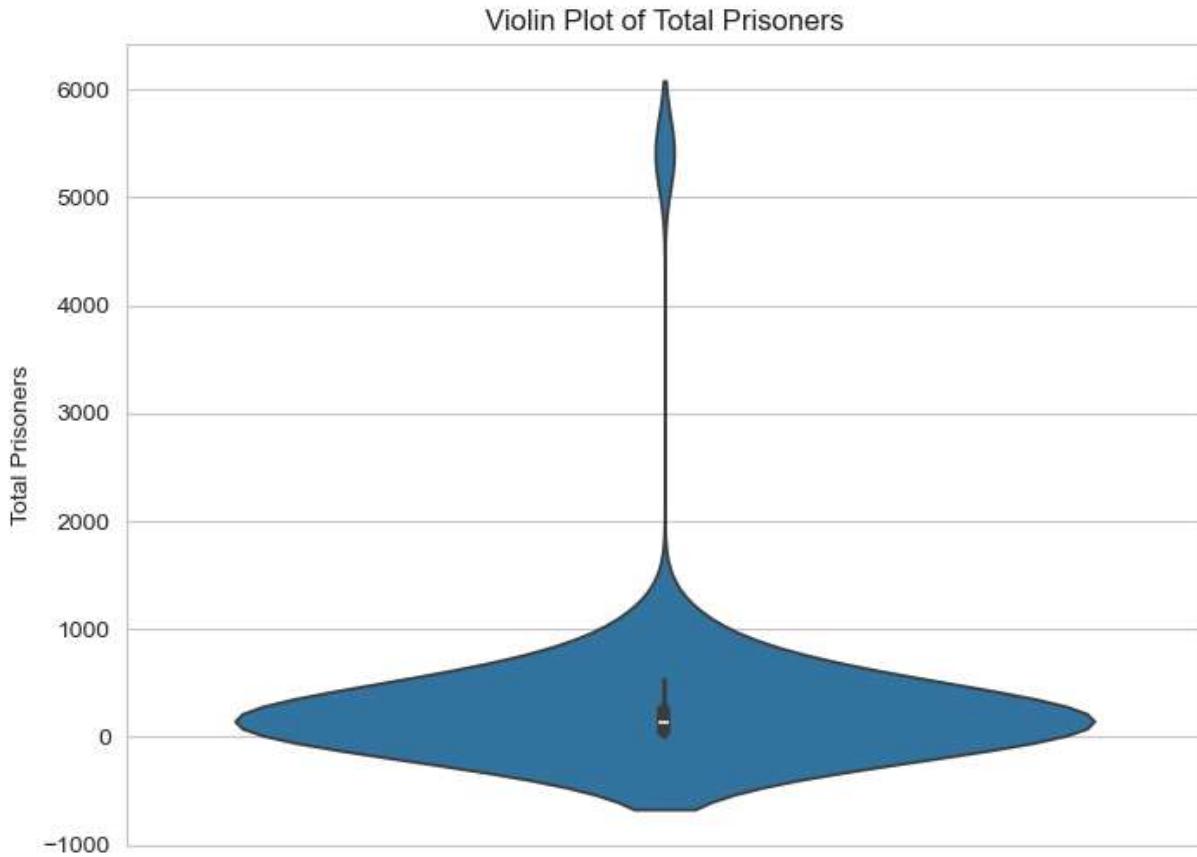


```
In [52]: plt.figure(figsize=(8, 6))
sns.violinplot(y=df_cleaned["Convict Prisoners"])
plt.title("Violin Plot of Convict Prisoners")
plt.ylabel("Convict Prisoners")
plt.show()
```

Violin Plot of Convict Prisoners



```
In [53]: plt.figure(figsize=(8, 6))
sns.violinplot(y=df_cleaned["Total"])
plt.title("Violin Plot of Total Prisoners")
plt.ylabel("Total Prisoners")
plt.show()
```



Observation of the dataset

1) Total Prison Population Distribution

- > The majority of prisoners belong to a few highly populated facilities.
- > A significant difference exists between under-trial and convicted prisoners.

2) Trend Analysis Over Time

- > If a time-series plot is present, it may show fluctuations in the number of inmates month-to-month.
- > Possible spikes in prison admissions due to seasonal or legal factors.

3) Under-Trial vs. Convicted Ratio

- > A high percentage of prisoners are under trial, indicating delays in judicial processes.
- > Some prisons have a disproportionate number of under-trial prisoners compared to convicts.

4) Prison Overcrowding

- > Some facilities exceed their capacity, leading to overcrowding.
- > Certain regions have prisons operating at or above 100% occupancy.

5) Demographic Analysis

- > If demographic data is available, graphs may show age-group distribution, gender ratios, or foreign prisoner statistics.
- > Younger age groups may be more represented in certain crime categories.

6) Regional Variation in Prison Population

- > Some states or regions have significantly higher prison populations than others, possibly due to differences in crime rates, law enforcement efficiency, or judicial processes.
- > Certain areas may have more under-trial prisoners, indicating slower legal proceedings in those regions.

7) Crime Category Distribution

- > If crime categories are analyzed, the data may show that a majority of prisoners are incarcerated for specific offenses (e.g., theft, drug-related crimes, or violent crimes).
- > There could be a trend where certain offenses lead to longer under-trial durations before conviction.