```
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns


df2 = pd.read_csv('LS_2.0.csv')


df2.rename(columns={'CRIMINAL\nCASES': 'criminal'}, inplace=True)


df2.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 2263 entries, 0 to 2262
Data columns (total 19 columns):
 #   Column                                     Non-Null Count  Dtype
---  ------                                     --------------  -----
 0   STATE                                      2263 non-null   object
 1   CONSTITUENCY                               2263 non-null   object
 2   NAME                                       2263 non-null   object
 3   WINNER                                     2263 non-null   int64
 4   PARTY                                      2263 non-null   object
 5   SYMBOL                                     2018 non-null   object
 6   GENDER                                     2018 non-null   object
 7   criminal                                   2018 non-null   object
 8   AGE                                        2018 non-null   float64
 9   CATEGORY                                   2018 non-null   object
 10  EDUCATION                                  2018 non-null   object
 11  ASSETS                                     2018 non-null   object
 12  LIABILITIES                                2018 non-null   object
 13  GENERAL
VOTES                              2263 non-null   int64
 14  POSTAL
VOTES                               2263 non-null   int64
 15  TOTAL
VOTES                                2263 non-null   int64
 16  OVER TOTAL ELECTORS
IN CONSTITUENCY      2263 non-null   float64
 17  OVER TOTAL VOTES POLLED
IN CONSTITUENCY  2263 non-null   float64
 18  TOTAL ELECTORS                             2263 non-null   int64
dtypes: float64(3), int64(5), object(11)
memory usage: 336.0+ KB
```

```
df2.describe()
```

| | WINNER | AGE | GENERAL\nVOTES | POSTAL\nVOTES | TOTAL\nVOTES | OVER TO ELECT \n CONSTITUE |
|---|---|---|---|---|---|---|
| **count** | 2263.000000 | 2018.000000 | 2.263000e+03 | 2263.000000 | 2.263000e+03 | 2263.000 |
| **mean** | 0.238179 | 52.273538 | 2.615991e+05 | 990.710561 | 2.625898e+05 | 15.811 |
| **std** | 0.426064 | 11.869373 | 2.549906e+05 | 1602.839174 | 2.559822e+05 | 14.962 |
| **min** | 0.000000 | 25.000000 | 1.339000e+03 | 0.000000 | 1.342000e+03 | 0.097 |
| **25%** | 0.000000 | 43.250000 | 2.103450e+04 | 57.000000 | 2.116250e+04 | 1.296 |
| **50%** | 0.000000 | 52.000000 | 1.539340e+05 | 316.000000 | 1.544890e+05 | 10.510 |

```
df2.corr()
```

| | WINNER | AGE | GENERAL\nVOTES | POSTAL\nVOTES | TOTAL\nVOTES | OV CONS |
|---|---|---|---|---|---|---|
| **WINNER** | 1.000000 | 0.110294 | 0.725678 | 0.520286 | 0.726125 | |
| **AGE** | 0.110294 | 1.000000 | 0.208567 | 0.129360 | 0.208600 | |
| **GENERAL\nVOTES** | 0.725678 | 0.208567 | 1.000000 | 0.616742 | 0.999988 | |
| **POSTAL\nVOTES** | 0.520286 | 0.129360 | 0.616742 | 1.000000 | 0.620614 | |
| **TOTAL\nVOTES** | 0.726125 | 0.208600 | 0.999988 | 0.620614 | 1.000000 | |
| **OVER TOTAL ELECTORS \nIN CONSTITUENCY** | 0.738976 | 0.207304 | 0.962219 | 0.630882 | 0.962441 | |
| **OVER TOTAL VOTES POLLED \nIN CONSTITUENCY** | 0.757303 | 0.223700 | 0.962905 | 0.634896 | 0.963150 | |
| **TOTAL ELECTORS** | 0.038107 | 0.021083 | 0.211092 | 0.038453 | 0.210515 | |

```
df2.isnull().values.any()
```

```
True
```

```
df2['criminal'].value_counts()
```

```
0    1242
1     313
2     119
3     104
4      64
```

```
5                  42
6                  26
Not Available      22
7                  18
8                  16
10                 11
9                  11
11                  5
12                  4
14                  4
13                  3
15                  2
28                  1
52                  1
24                  1
41                  1
42                  1
16                  1
40                  1
204                 1
240                 1
31                  1
22                  1
18                  1
Name: criminal, dtype: int64
```

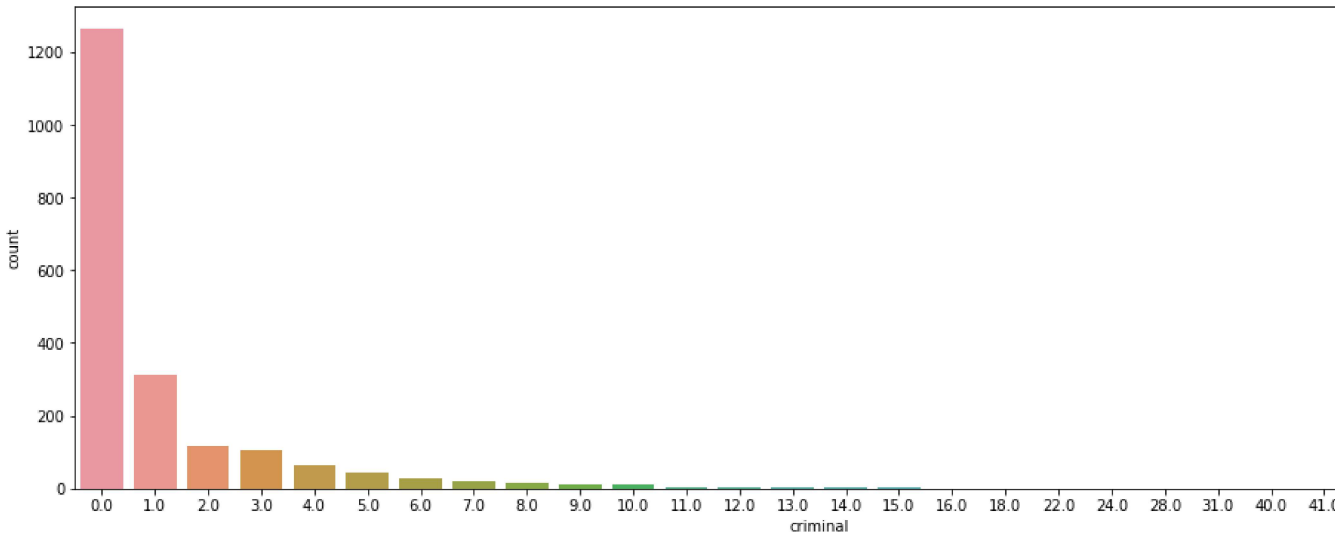
```
df2['criminal'] = df2['criminal'].replace(['Not Available'],'0')
df2['criminal'] = pd.to_numeric(df2['criminal'] , errors='coerce')
df2['criminal'].value_counts()
df2['criminal'].isna()
```

```
0       False
1       False
2       False
3        True
4       False
        ...
2258    False
2259    False
2260    False
2261    False
2262     True
Name: criminal, Length: 2263, dtype: bool
```

```
df2['criminal'].isnull().sum().sum()
```

```
245
```

```
plt.figure(figsize=(18,6))
sns.countplot(x='criminal',data=df2);
```




```
df2['criminal'].describe()
```

```
count    2018.000000
mean        1.453915
std         7.636973
min         0.000000
25%         0.000000
50%         0.000000
75%         1.000000
max       240.000000
Name: criminal, dtype: float64
```

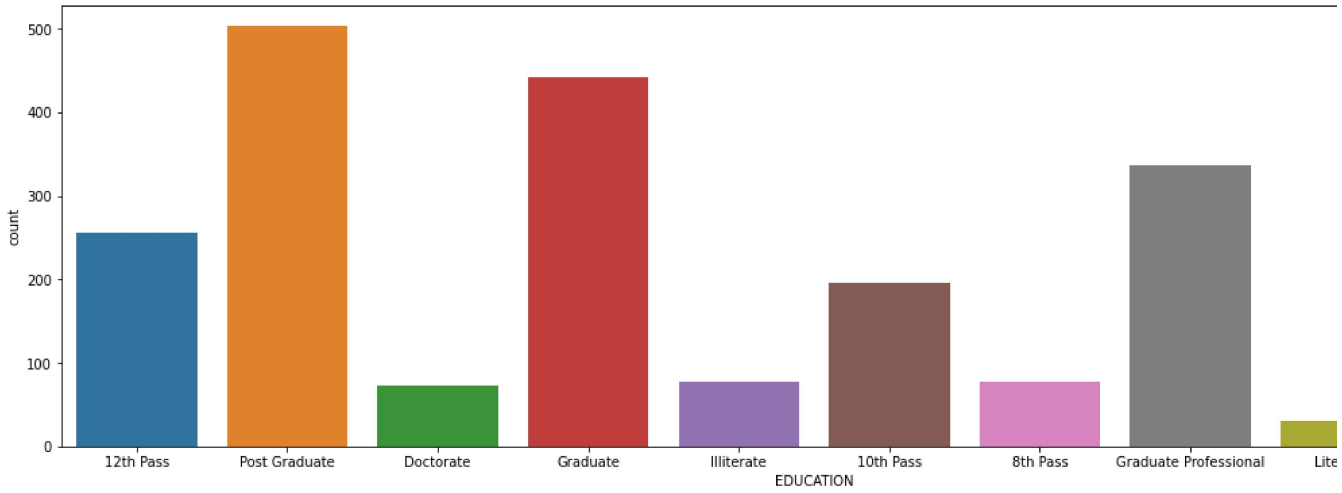
```
df2.EDUCATION.value_counts()
```

```
Post Graduate            502
Graduate                 441
Graduate Professional    336
12th Pass                256
10th Pass                196
8th Pass                  78
Doctorate                 73
Others                    50
Literate                  30
5th Pass                  28
Not Available             22
Illiterate                 5
Post Graduate\n            1
Name: EDUCATION, dtype: int64
```

```
df2['EDUCATION'] = df2['EDUCATION'].replace(['Not Available','Others'],'Illiterate')
df2['EDUCATION'] = df2['EDUCATION'].replace(['Post Graduate\n'],'Post Graduate')
df2['EDUCATION'].value_counts()
```

```
Post Graduate            503
Graduate                 441
Graduate Professional    336
12th Pass                256
10th Pass                196
8th Pass                  78
Illiterate                77
Doctorate                 73
Literate                  30
5th Pass                  28
Name: EDUCATION, dtype: int64
```

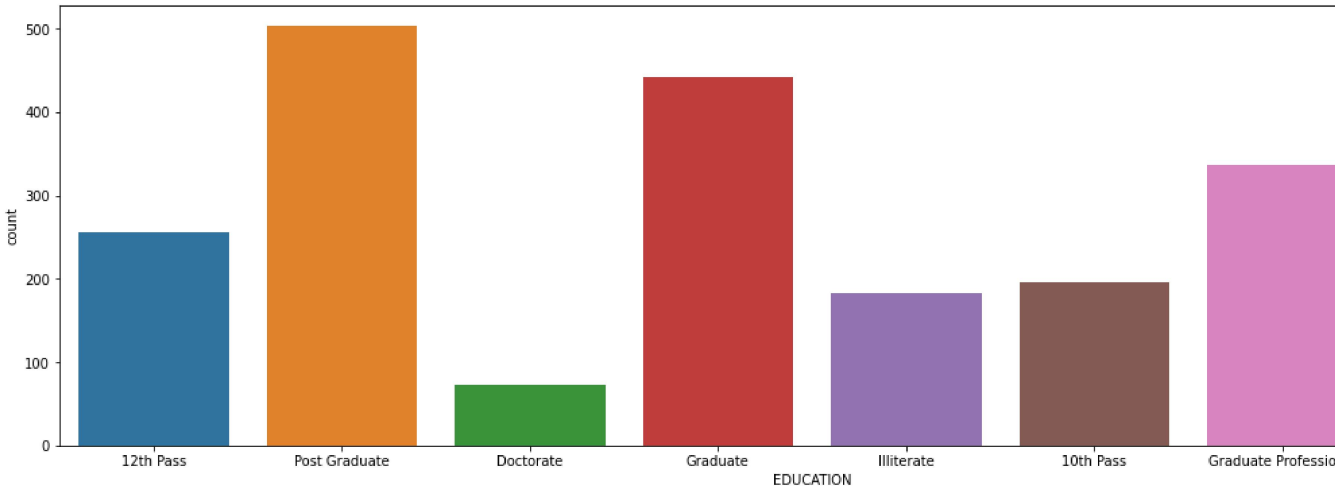
```
plt.figure(figsize=(20,6))
sns.countplot(x='EDUCATION',data=df2);
```



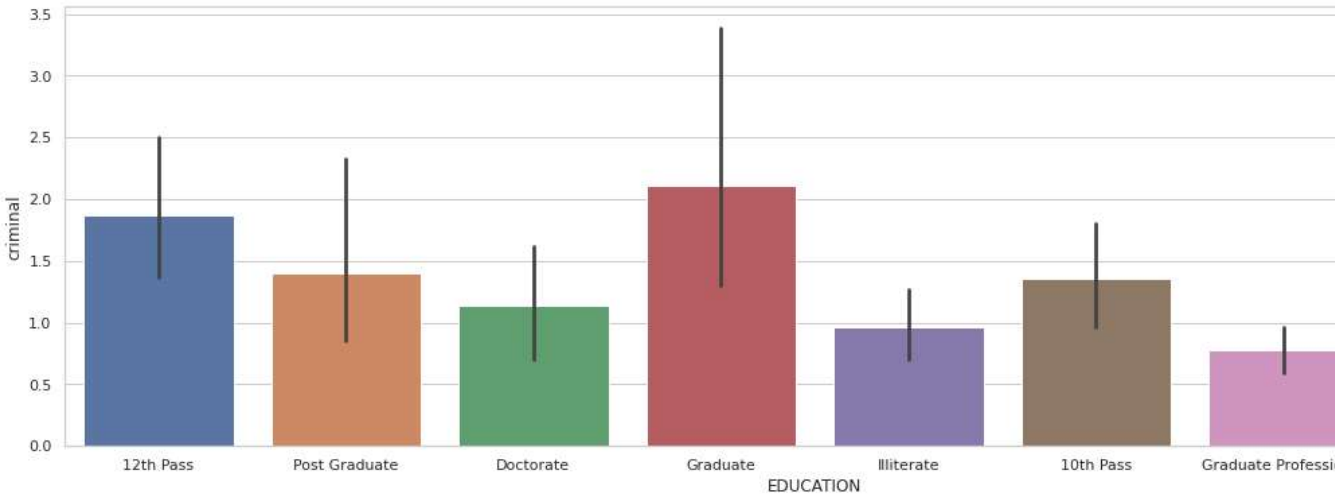

```
df2['EDUCATION'] = df2['EDUCATION'].replace(['5th Pass','8th Pass'],'Illiterate')
df2['EDUCATION'].value_counts()
```

```
Post Graduate            503
Graduate                 441
Graduate Professional    336
12th Pass                256
10th Pass                196
Illiterate               183
Doctorate                 73
Literate                  30
Name: EDUCATION, dtype: int64
```

```
plt.figure(figsize=(20,6))
sns.countplot(x='EDUCATION',data=df2);
```




```
import seaborn as sns
sns.set_theme(style="whitegrid")
plt.figure(figsize=(20,6))
ax = sns.barplot(x="EDUCATION", y="criminal", data=df2)
```

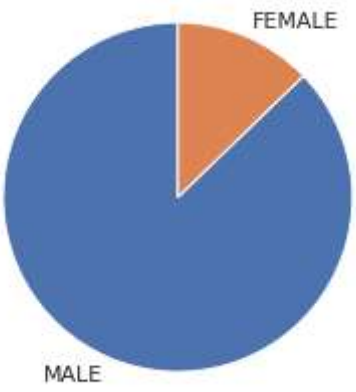



```
cn1= int (0)
cn2= int (0)
for i in df2['GENDER']:
  if i=='MALE':
    cn1+=1
  elif i=='FEMALE':
```

```
        cn2+=1
    print(cn1)
    print(cn2)
```

```
     1760
     258
```

```
    y = np.array([cn1,cn2])
    mylabels = ["MALE","FEMALE"]
    plt.pie(y, labels = mylabels, startangle = 90)
    plt.show()
```

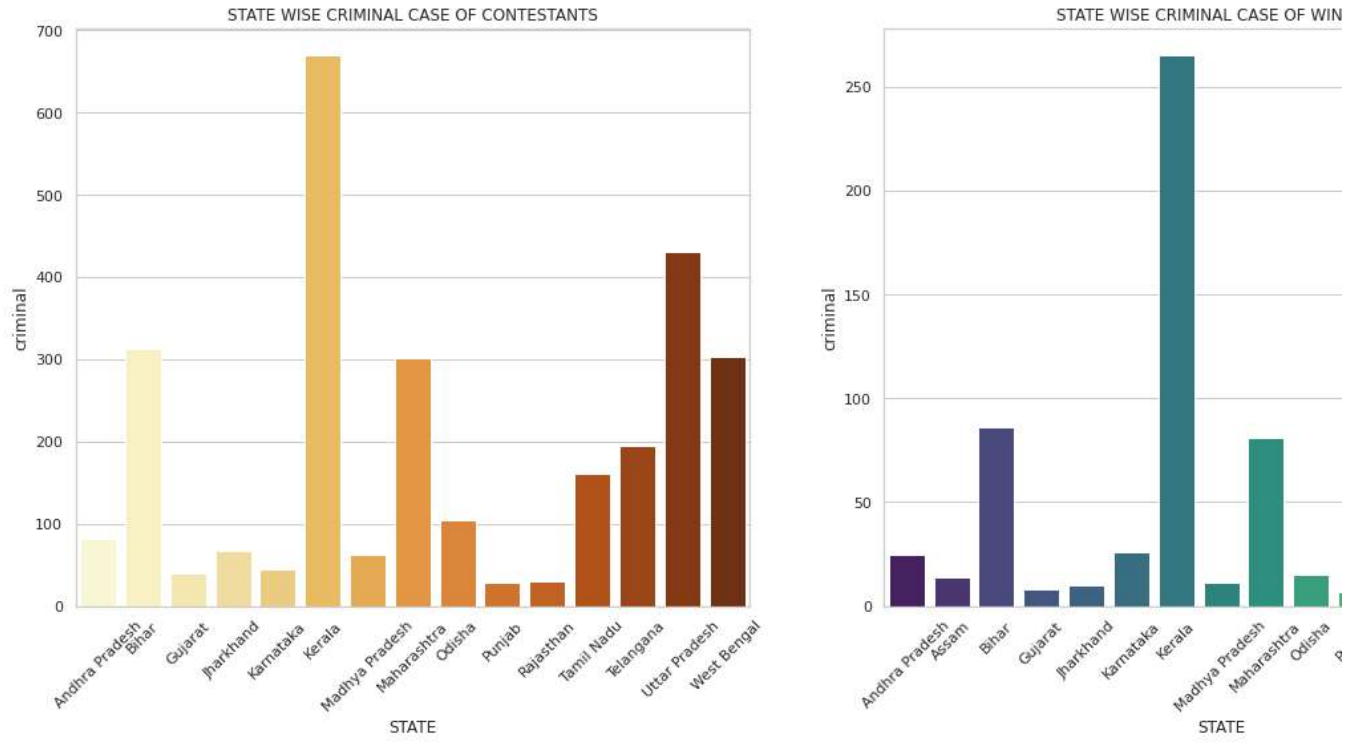



```
    state_criminal = df2.groupby('STATE')[['criminal']].sum().sort_values(by=
                          ['criminal']).tail(15).sort_values(by=['STATE'])

    state_criminal_winner = df2[df2['WINNER']>0].groupby('STATE')[['criminal']].sum().sort_values
                          ['criminal']).tail(15).sort_values(by=['STATE'])
    state_criminal
```

| STATE | criminal |
|---|---|
| Andhra Pradesh | 81.0 |
| Bihar | 312.0 |
| Gujarat | 39.0 |
| Jharkhand | 67.0 |
| Karnataka | 44.0 |

```
fig, axes = plt.subplots(1, 2, figsize=(20, 8))
sns.barplot(x = state_criminal.index , y = state_criminal['criminal'] , ax=axes[0] , palette=
axes[0].tick_params(axis='x' , rotation=45);
axes[0].set_title('STATE WISE CRIMINAL CASE OF CONTESTANTS');
sns.barplot(x = state_criminal_winner.index , y = state_criminal_winner['criminal'] , ax=axes
axes[1].set_title('STATE WISE CRIMINAL CASE OF WINNERS');
plt.xticks(rotation=45);
```



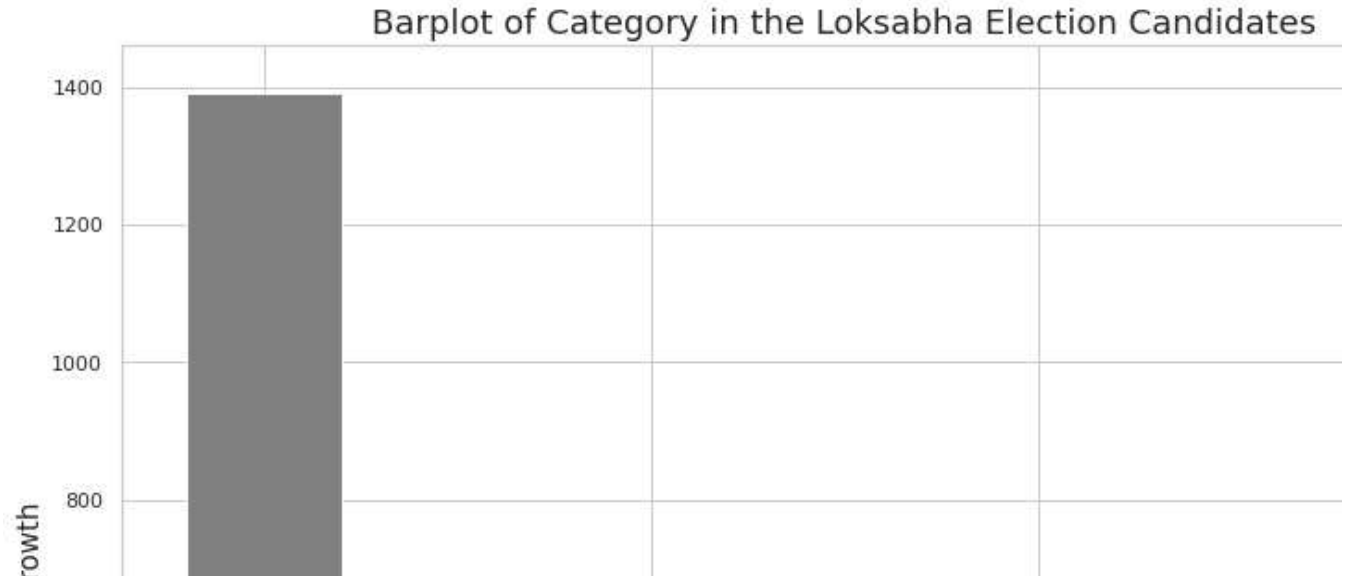

```
cn1= int (0)
cn2= int (0)
```

```
cn3= int (0)
cn4= int (0)
for i in df2['CATEGORY']:
  if i=='SC':
    cn1+=1
  elif i=='ST':
    cn2+=1
  elif i=='GENERAL':
    cn3+=1
  else:
    cn4+=1
print(cn1)
print(cn2)
print(cn3)
print(cn4)
```

```
383
243
1392
245
```

```
consumption = ['SC','ST','GENERAL','OTHERS']
growth = [cn1,cn2,cn3,cn4]
df = pd.DataFrame({"consumption": consumption,
                   "growth": growth})
df_sorted_desc= df.sort_values('growth',ascending=False)
plt.figure(figsize=(14,10))
plt.bar('consumption', 'growth',data=df_sorted_desc,color ='grey',
        width = 0.4)
plt.xlabel("Category", size=15)
plt.ylabel("growth", size=15)
plt.title("Barplot of Category in the Loksabha Election Candidates", size=18)
```

```
Text(0.5, 1.0, 'Barplot of Category in the Loksabha Election Candidates')
```




```
cn1= int (0)
cn2= int (0)
cn3= int (0)
cn4= int (0)
cn5= int (0)
cn6= int (0)
for i in df2['PARTY']:
  if i=='BJP':
    cn1+=1
  elif i=='INC':
    cn2+=1
  elif i=='NOTA':
    cn3+=1
  elif i=='IND':
    cn4+=1
  elif i=='BSP':
    cn5+=1
  else:
    cn6+=1
    print(cn1)
print(cn2)
print(cn3)
print(cn4)
print(cn5)
print(cn6)
```

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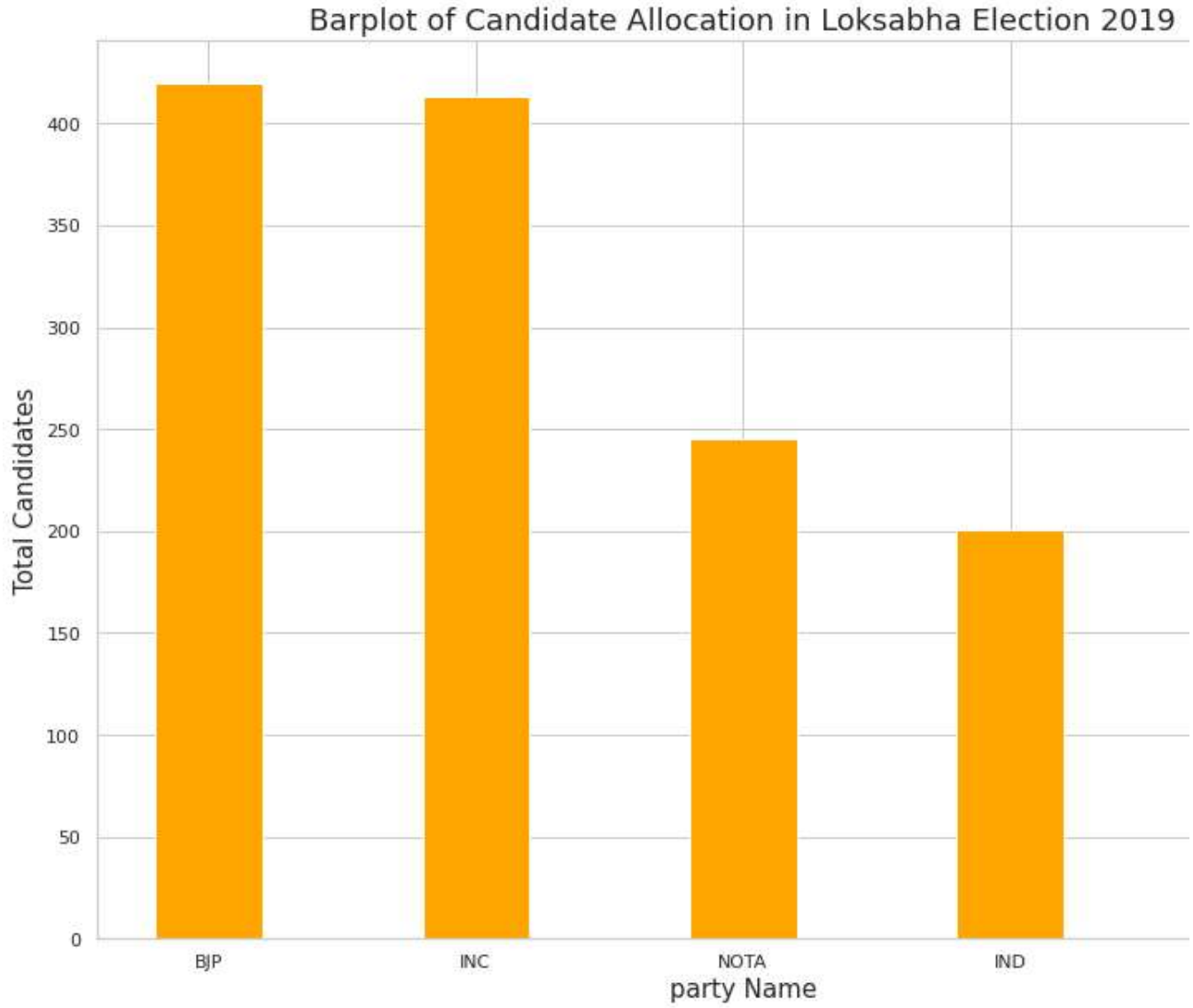
35
```

```
consumption = ['BJP','INC','NOTA','IND','BSP']
growth = [cn1,cn2,cn3,cn4,cn5]
df = pd.DataFrame({"consumption": consumption,
                   "growth": growth})
df_sorted_desc= df.sort_values('growth',ascending=False)
```

```
plt.figure(figsize=(14,10))
plt.bar('consumption', 'growth',data=df_sorted_desc,color ='orange',
        width = 0.4)
plt.xlabel("party Name", size=15)
plt.ylabel("Total Candidates", size=15)
plt.title("Barplot of Candidate Allocation in Loksabha Election 2019", size=18)
```

```
Text(0.5, 1.0, 'Barplot of Candidate Allocation in Loksabha Election 2019')
```



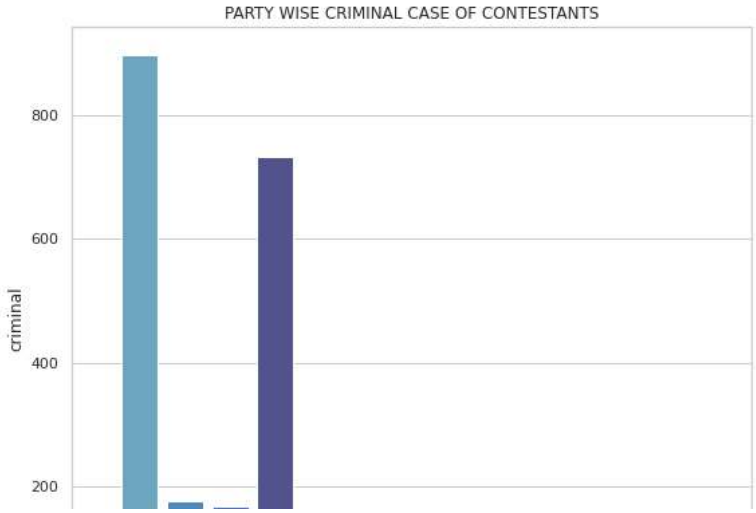

```
df2['criminal'] = pd.to_numeric(df2['criminal'] , errors='coerce')
```

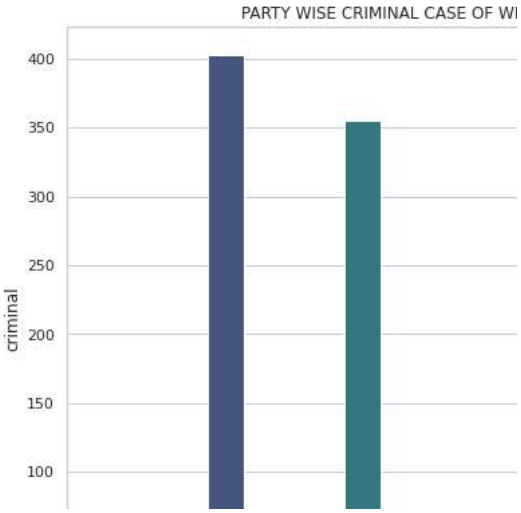
```
party_criminal_winner = df2[df2['criminal']>0].groupby('PARTY')[['criminal']].sum().sort_valu
                        ['criminal']).tail(15).sort_values(by=['PARTY'])
party_winner = df2[(df2['criminal']>0) & (df2['WINNER']>0)].groupby('PARTY')[['criminal']].su
                        ['criminal']).tail(15).sort_values(by=['PARTY'])

party_winner
```

| PARTY | criminal |
|---|---|
| AIMIM | 9.0 |
| AITC | 17.0 |
| AIUDF | 7.0 |
| BJP | 403.0 |
| BSP | 32.0 |
| DMK | 28.0 |
| INC | 355.0 |
| IND | 6.0 |
| JD(U) | 31.0 |
| LJP | 12.0 |
| NCP | 10.0 |
| SHS | 35.0 |
| SP | 11.0 |
| TRS | 24.0 |
| YSRCP | 24.0 |

```
fig, axes = plt.subplots(1, 2, figsize=(20, 8))
sns.barplot(x = party_criminal_winner.index , y = party_criminal_winner['criminal'] , ax=axes
axes[0].tick_params(axis='x' , rotation=45);
axes[0].set_title('PARTY WISE CRIMINAL CASE OF CONTESTANTS');
sns.barplot(x = party_winner.index , y = party_winner['criminal'] , ax=axes[1] , palette='vir
axes[1].set_title('PARTY WISE CRIMINAL CASE OF WINNERS');
plt.xticks(rotation=45);
```

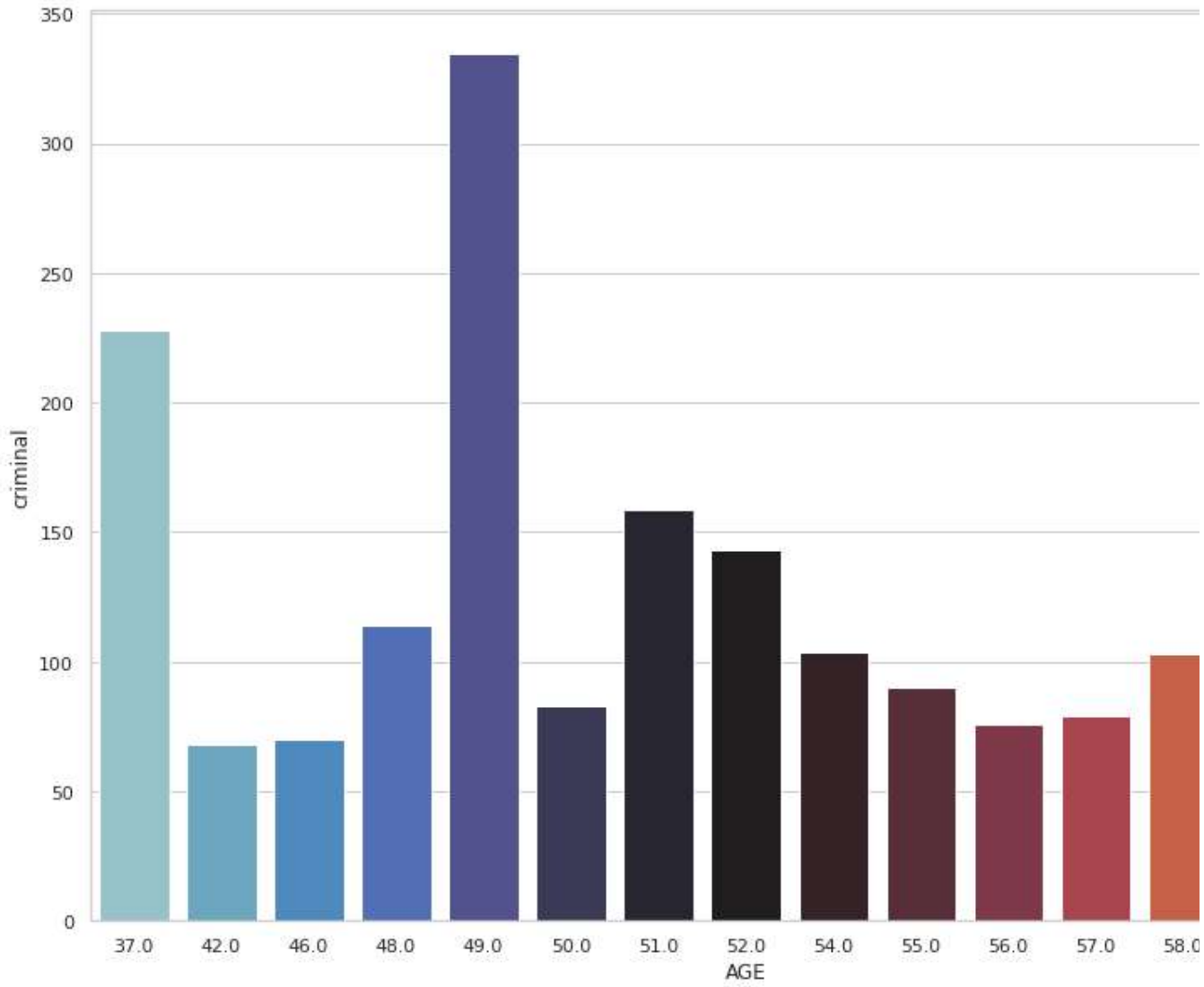



```
age_criminal = df2[df2['criminal']>0].groupby('AGE')[['criminal']].sum().sort_values(by=
                        ['criminal']).tail(15).sort_values(by=['AGE'])
age_criminal
```

| AGE | criminal |
|---|---|
| **37.0** | 228.0 |
| **42.0** | 68.0 |
| **46.0** | 70.0 |
| **48.0** | 114.0 |
| **49.0** | 335.0 |
| **50.0** | 83.0 |
| **51.0** | 159.0 |
| **52.0** | 143.0 |
| **54.0** | 104.0 |
| **55.0** | 90.0 |
| **56.0** | 76.0 |
| **57.0** | 79.0 |
| **58.0** | 103.0 |
| **60.0** | 81.0 |
| **63.0** | 91.0 |

```
plt.figure(figsize=(14,10))
sns.barplot(x = age_criminal.index , y = age_criminal['criminal'] , palette='icefire');
```

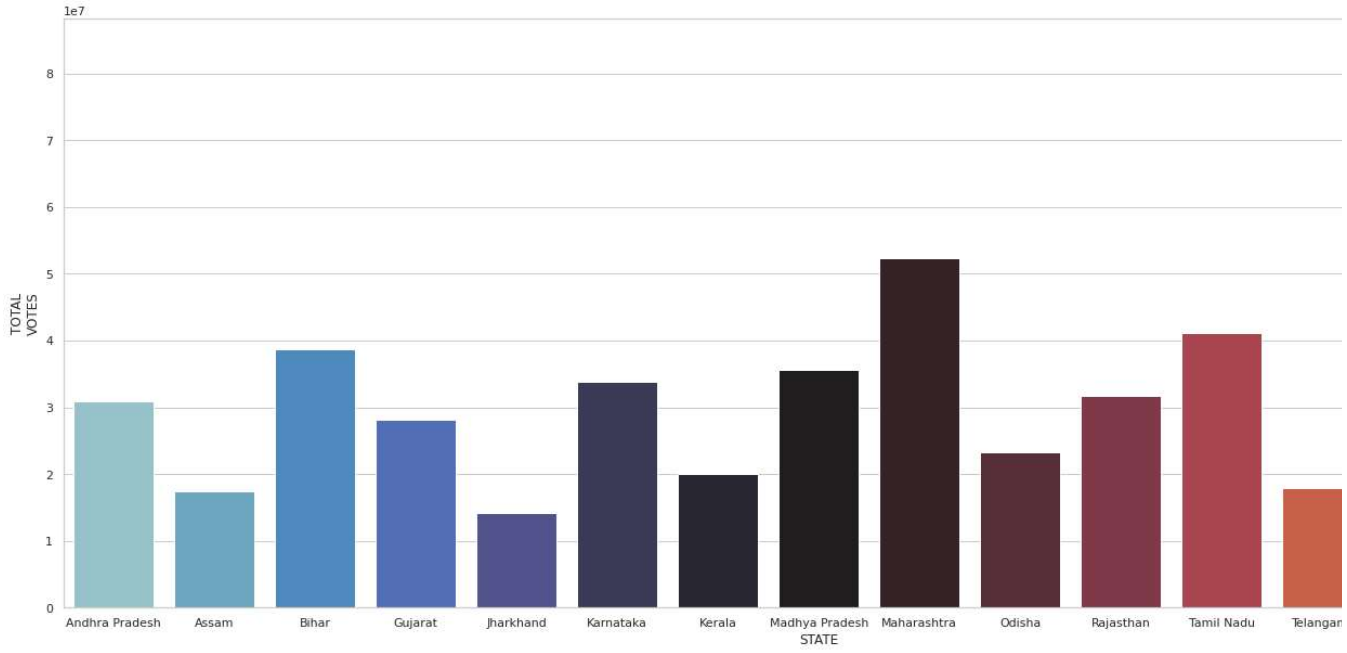



```
total_voter1 = df2[df2['TOTAL\nVOTES']>0].groupby('STATE')[['TOTAL\nVOTES']].sum().sort_value
                      ['TOTAL\nVOTES']).tail(15).sort_values(by=['STATE'])

total_voter1
```

| STATE | TOTAL\nVOTES |
|---|---|
| Andhra Pradesh | 30968703 |
| Assam | 17441534 |
| Bihar | 38755595 |
| Gujarat | 28158684 |
| Jharkhand | 14253127 |
| Karnataka | 33859226 |
| Kerala | 20010727 |

```
plt.figure(figsize=(25,10))
sns.barplot(x = total_voter1.index , y = total_voter1['TOTAL\nVOTES'] , palette='icefire');
```




```
fm = df2.groupby(['GENDER','WINNER'])[['criminal']].sum().sort_values(by=
                        ['criminal']).tail(15).sort_values(by=['GENDER'])

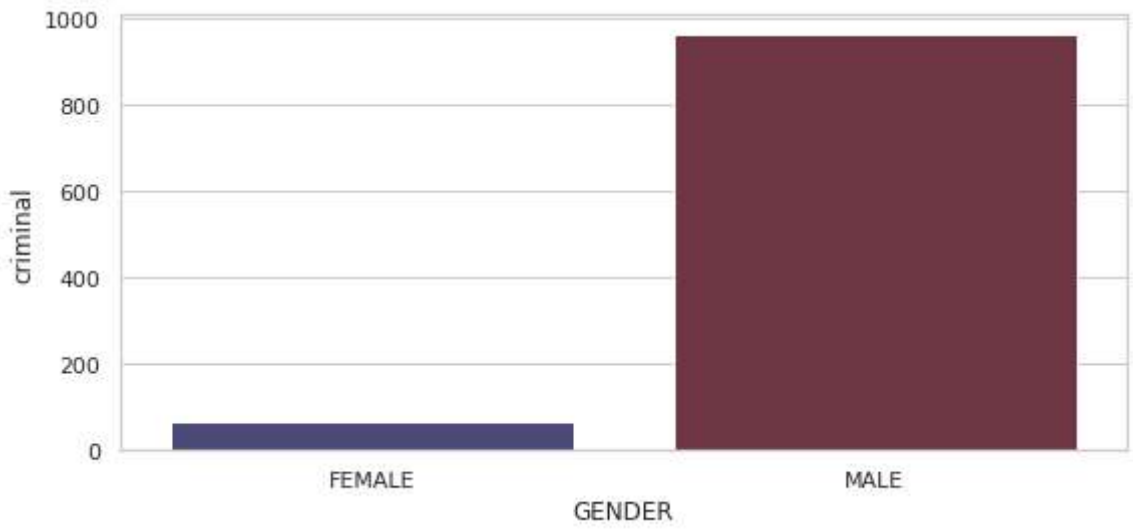
fm
```

| | | criminal |
|---|---|---|
| GENDER | WINNER | |
| FEMALE | 1 | 65.0 |
| | 0 | 171.0 |
| MALE | 1 | 964.0 |

```
party_winner1 = df2[(df2['criminal']>0) & (df2['WINNER']>0)].groupby('GENDER')[['criminal']].
                        ['criminal']).tail(15).sort_values(by=['GENDER'])
party_winner1
```

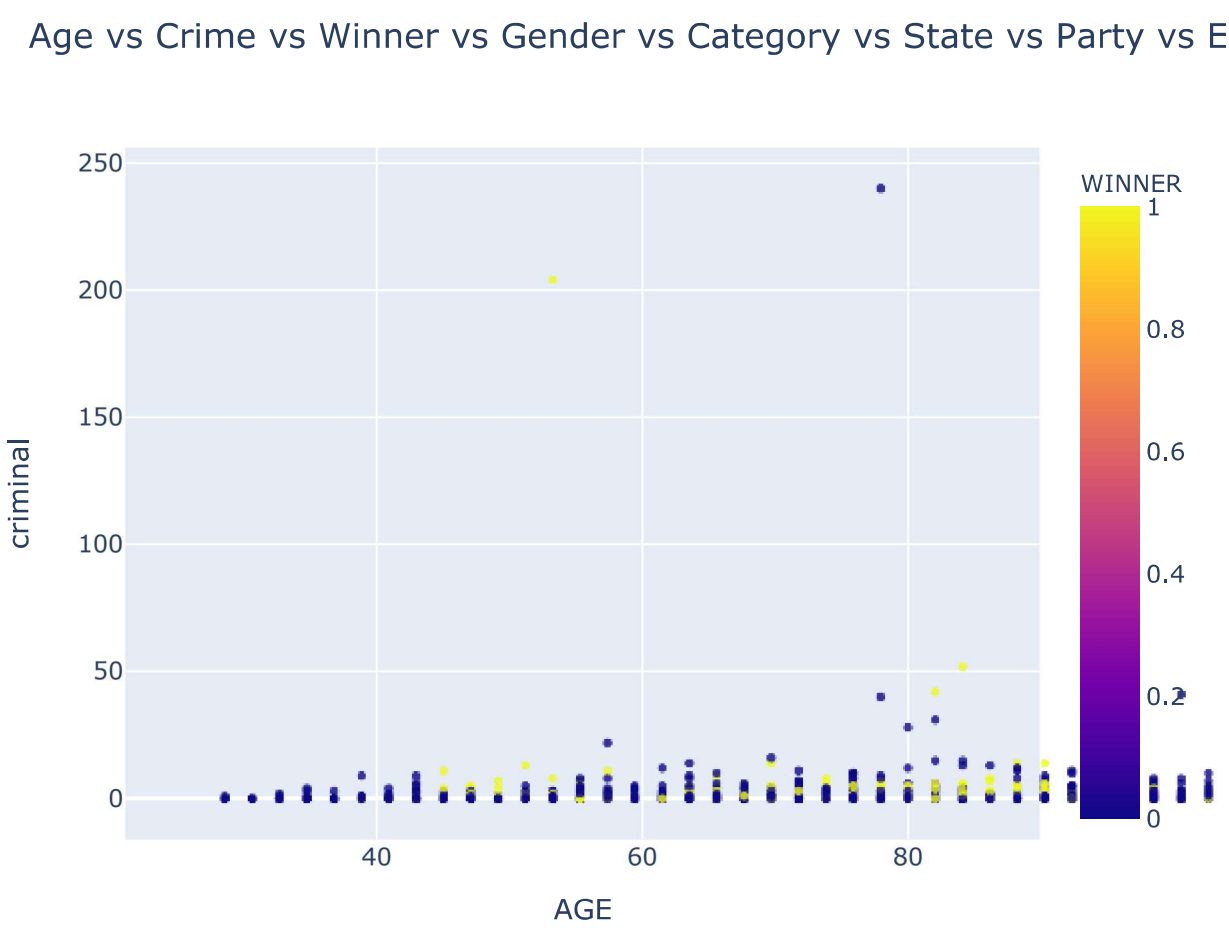
| | criminal |
|---|---|
| GENDER | |
| FEMALE | 65.0 |
| MALE | 964.0 |

```
plt.figure(figsize=(9,4))
sns.barplot(x = party_winner1.index , y = party_winner1['criminal']  , palette='icefire');
```




```
import plotly.express as px
import matplotlib
import matplotlib.pyplot as plt
import seaborn as sns
%matplotlib inline
sns.set_style('darkgrid')
matplotlib.rcParams['font.size'] = 14
matplotlib.rcParams['figure.figsize'] = (10, 6)
matplotlib.rcParams['figure.facecolor'] = '#00000000'
```

```
fig = px.scatter(df2,
                 x='AGE',
                 y='criminal',
                 color='WINNER',
                 opacity=0.8,
                 hover_data=['GENDER','CATEGORY','STATE','PARTY','NAME','EDUCATION'],
                 title='Age vs Crime vs Winner vs Gender vs Category vs State vs Party vs Edu
fig.update_traces(marker_size=5)
fig.show()
```




```
df=df2[df2.EDUCATION=='Doctorate']
df.shape
```

```
(73, 19)
```

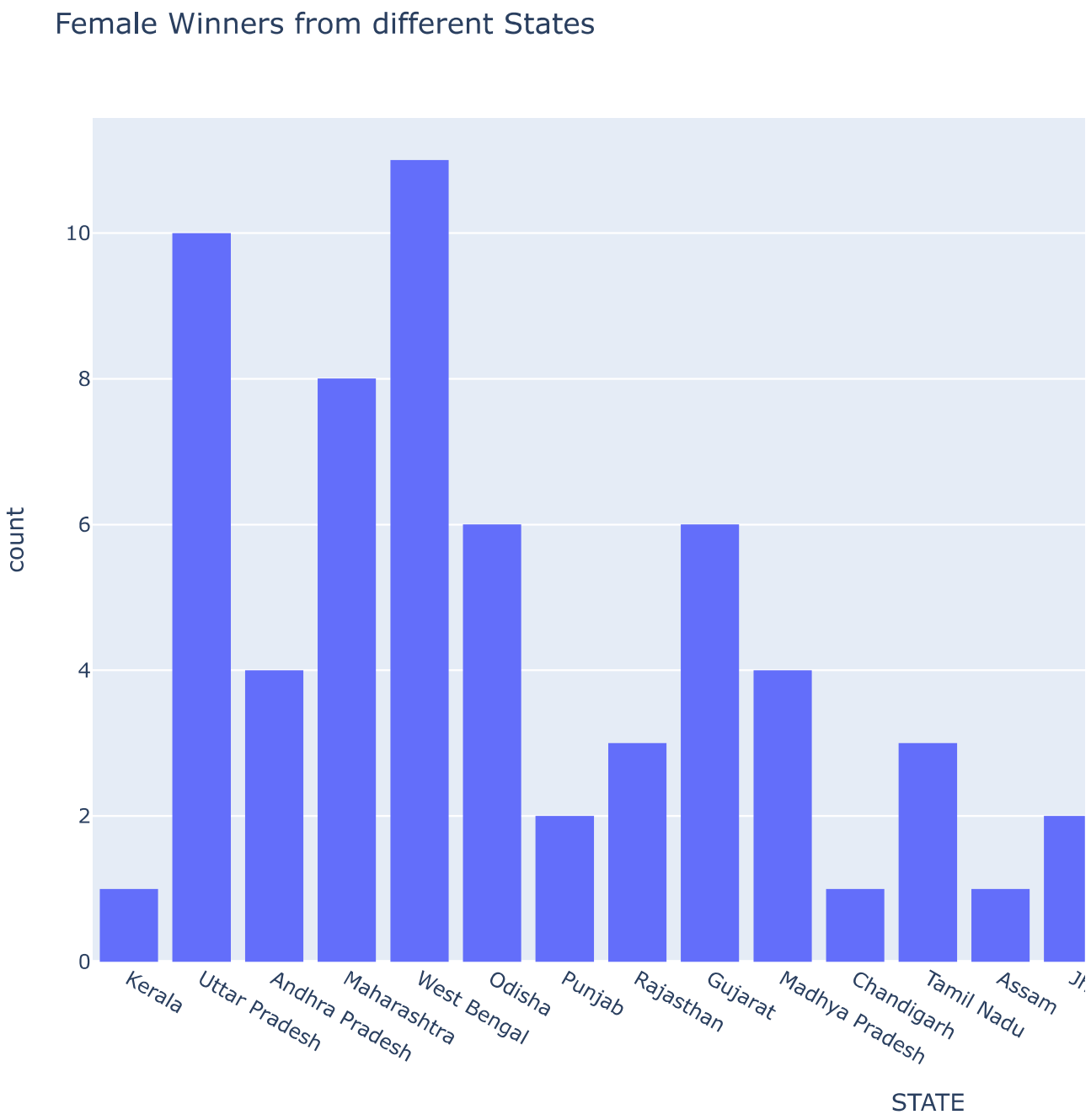
```
df=df[df.WINNER==1]
df.shape
```

```
(23, 19)
```

```
df1=df[(df.PARTY=='BJP') & (df.WINNER==1)]
df1.shape
```

```
(14, 19)
```

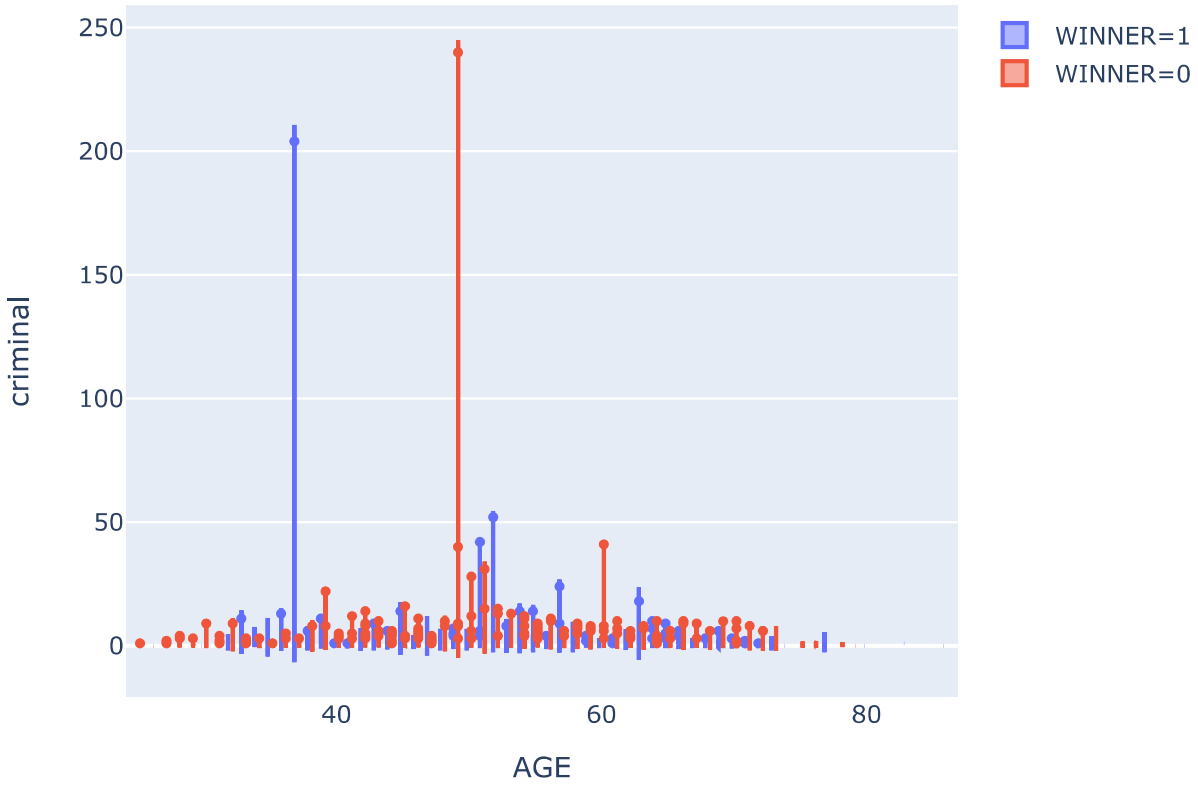
```
Female_winners = df2[(df2['WINNER']==1) & (df2['GENDER']=='FEMALE')]
ax = px.histogram(Female_winners, 'STATE', title = 'Female Winners from different States',wic
ax.show()
```




```
fig = px.violin(df2,
                x='AGE',
                y='criminal',
```

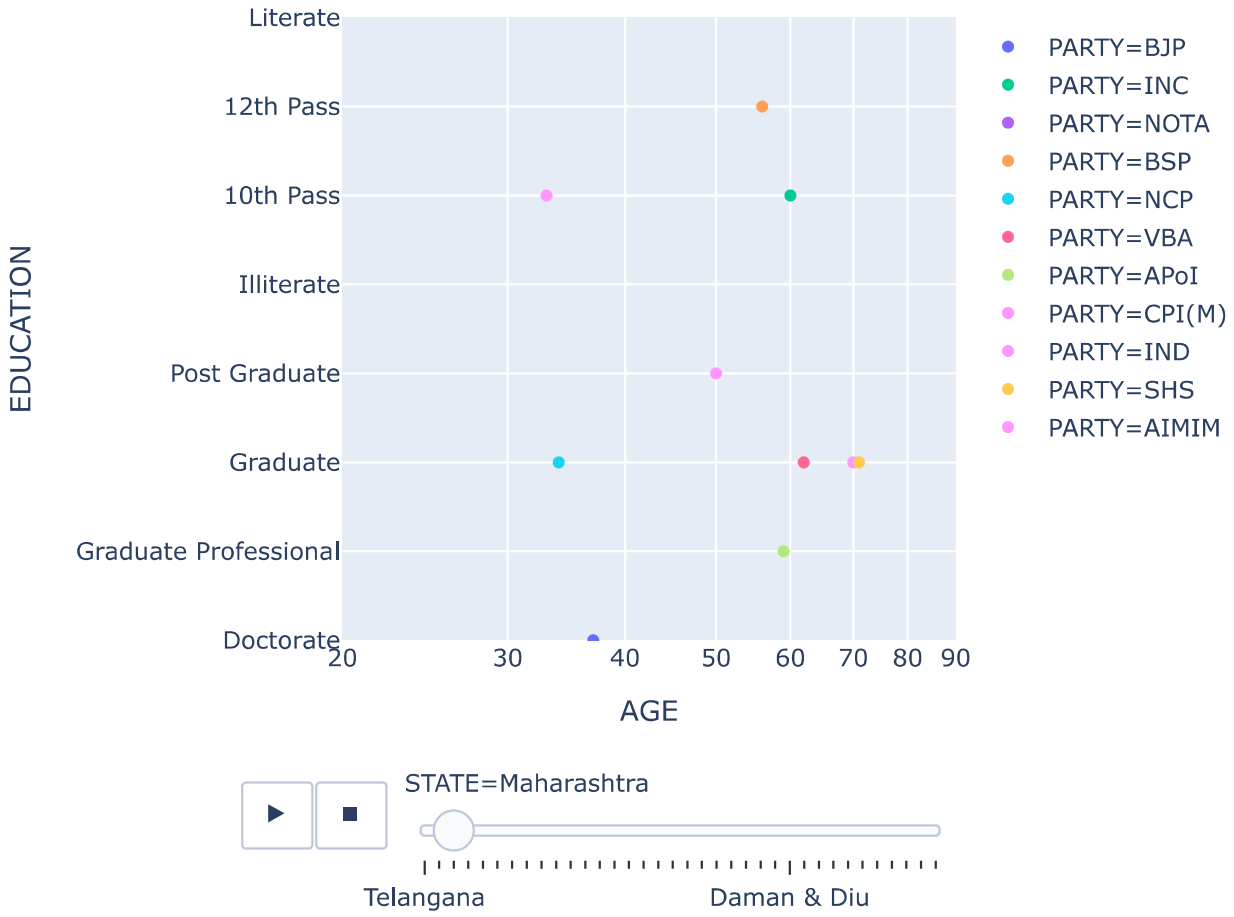
```
                  color='WINNER',

                  hover_data=['GENDER','CATEGORY','STATE','PARTY','NAME','EDUCATION'],
                  title='Age vs Crime vs Winner vs Gender vs Category vs State vs Party vs Edu
fig.update_traces(marker_size=5)
fig.show()
```




```
fig = px.scatter(df2,
                  x="AGE",
                  y="EDUCATION",
                  animation_frame="STATE",
                  animation_group="PARTY",
                    color="PARTY",
                  hover_name="CONSTITUENCY",
                  log_x=True,
                  size_max=80,
                  range_x=[20,90],
                  range_y=[0,7])

fig.show()
```

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