## LabCycle -8

Road Accidents Dataset

1.Find no. of accidents happened during day time & night time in Andhra Pradesh and show them using plot

df1=df[df['STATE/UT']=='Andhra Pradesh']

day=df1[['6-9 hrs (Day)','9-12 hrs (Day)','12-15 hrs (Day)','15-18 hrs (Day)']].sum(axis=1)

night=df1[['0-3 hrs. (Night)','3-6 hrs. (Night)','18-21 hrs (Night)','21-

24 hrs (Night)']].sum(axis=1)

plt.plot(df1['YEAR'],day,'go-',label="days")

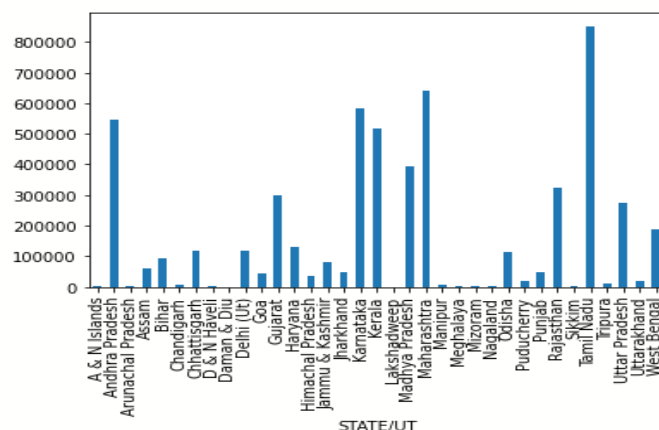plt.plot(df1['YEAR'],night,'ro-',label="night")

plt.legend()

plt.show()

Output:
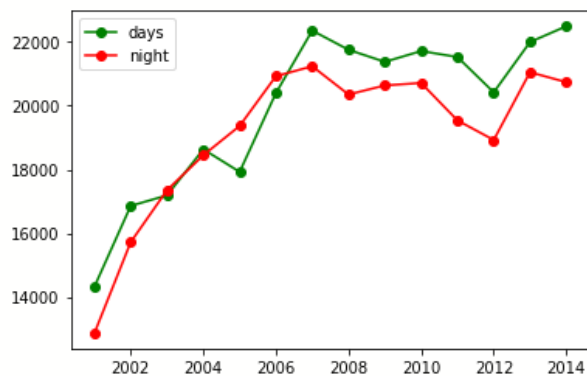
2.Find total no. of accidents happened in all states and draw the plot to show the results.

a=df.groupby(df['STATE/UT'])['Total'].sum()
a.plot.bar()
plt.show()
**Output:**

3.Find the accidents happened during early hours in south and display them using subpl ots.

```
south=['A & N Islands','Andhra Pradesh','Chhattisgarh','D & N Haveli','Goa','Karnataka','Kerala','Lakshad
weep','Maharashtra','Odisha','Tamil Nadu','Puducherry']
df1=df.groupby('STATE/UT')[['0-3 hrs. (Night)']].sum()
plt.subplot(2,1,1)
plt.plot(south,df1.loc[south],marker='o')
plt.xticks(rotation=90)
plt.subplot(2,1,2)
df2=df.groupby('STATE/UT')[['3-6 hrs. (Night)']].sum()
plt.plot(south,df2.loc[south],marker='o')
plt.xticks(rotation=90)
plt.show()
```

Output:
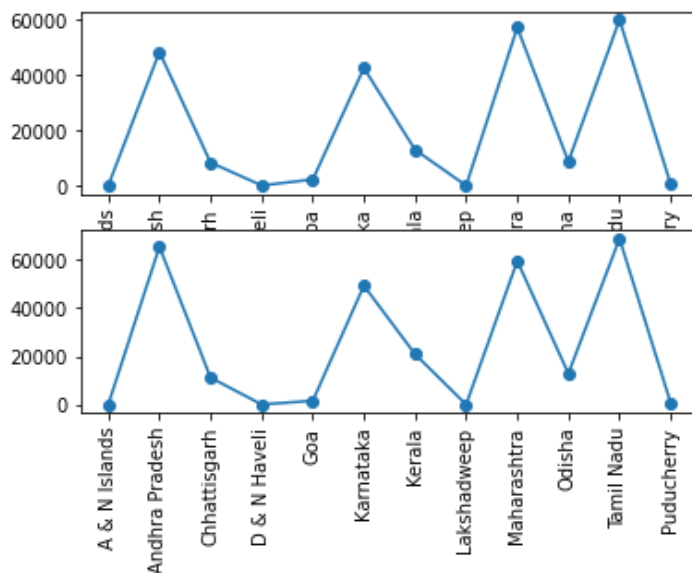
4. Find the states with maximum accidents, minimum accidents in each period & show t hem using plots.

```
max_day = df.groupby("STATE/UT")["6-9 hrs (Day)"].max()
min_day = df.groupby("STATE/UT")["6-9 hrs (Day)"].min()
max_night = df.groupby("STATE/UT")["18-21 hrs (Night)"].max()
min_night = df.groupby("STATE/UT")["18-21 hrs (Night)"].min()
# Plot the results
fig, axs = plt.subplots(2, 2, figsize=(12, 8))
max_day.plot(kind="bar", ax=axs[0, 0], title="States with Maximum Accidents (Day)")
min_day.plot(kind="bar", ax=axs[0, 1], title="States with Minimum Accidents (Day)")
max_night.plot(kind="bar", ax=axs[1, 0], title="States with Maximum Accidents (Night)")
min_night.plot(kind="bar", ax=axs[1, 1], title="States with Minimum Accidents (Night)")
plt.tight_layout()
```

plt.show()

Output:
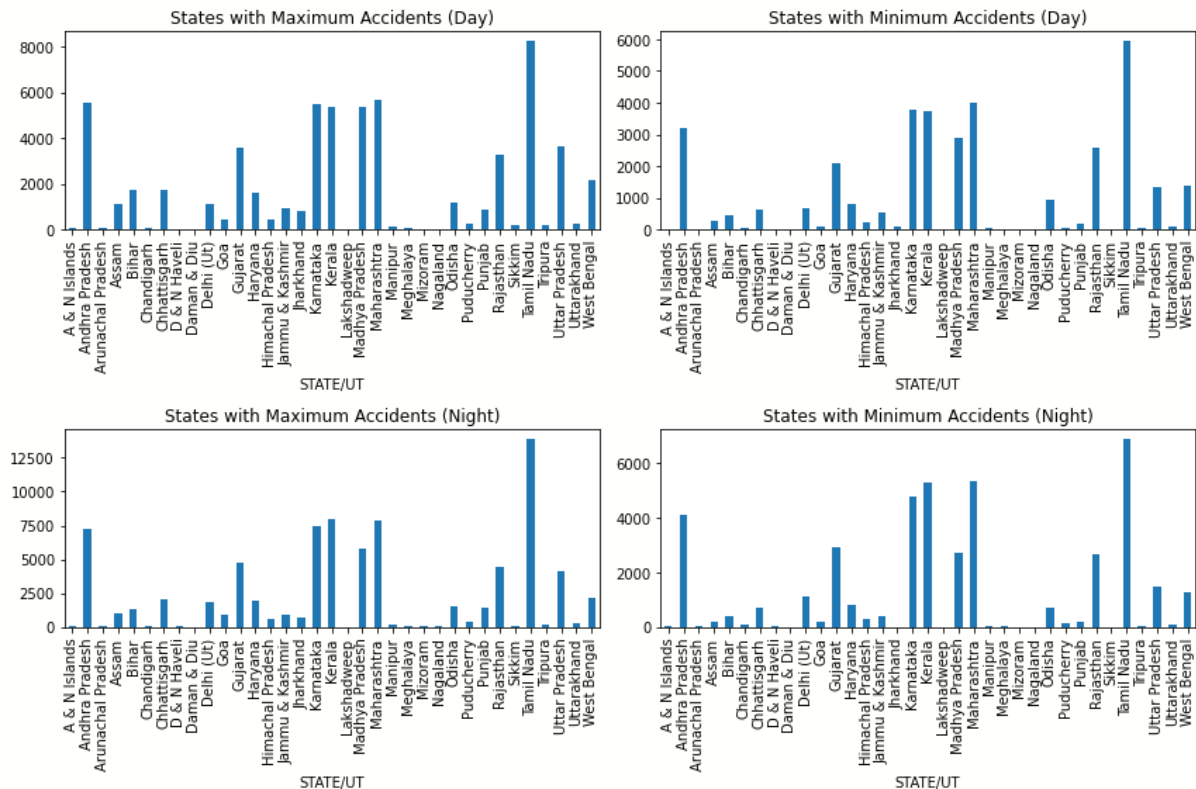
5.Find the states with accidents more than average no. of accidents during day time & night time and show them using plots.

df['day']=df[['6-9 hrs (Day)','9-12 hrs (Day)','12-15 hrs (Day)','15-18 hrs (Day)']].sum(axis=1)

df['night']=df[['0-3 hrs. (Night)','3-6 hrs. (Night)','18-21 hrs (Night)','21-

24 hrs (Night)']].sum(axis=1)

avg_day=df['day'].mean()

print("Day Average :",avg_day)

df1=df.groupby('STATE/UT')['day'].sum()

df1=df1.reset_index('STATE/UT')
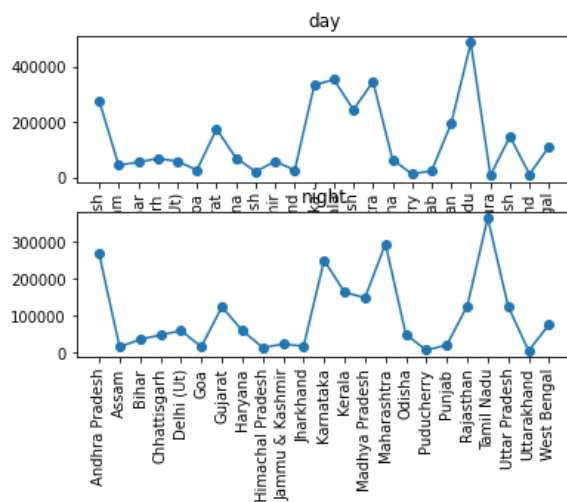
d=df1[df1['day']>avg_day][['STATE/UT','day']]

avg_night=df['night'].mean()

df1=df.groupby('STATE/UT')['night'].sum()

df1=df1.reset_index('STATE/UT')

n=df1[df1['night']>avg_night][['STATE/UT','night']]

plt.subplot(211),plt.plot(d['STATE/UT'],d['day'],'o-'),plt.title("day")

plt.xticks(rotation=90)

print("Night Average :",avg_night)

plt.subplot(212),plt.plot(n['STATE/UT'],n['night'],'o-'),plt.title("night")

plt.xticks(rotation=90)

plt.show()

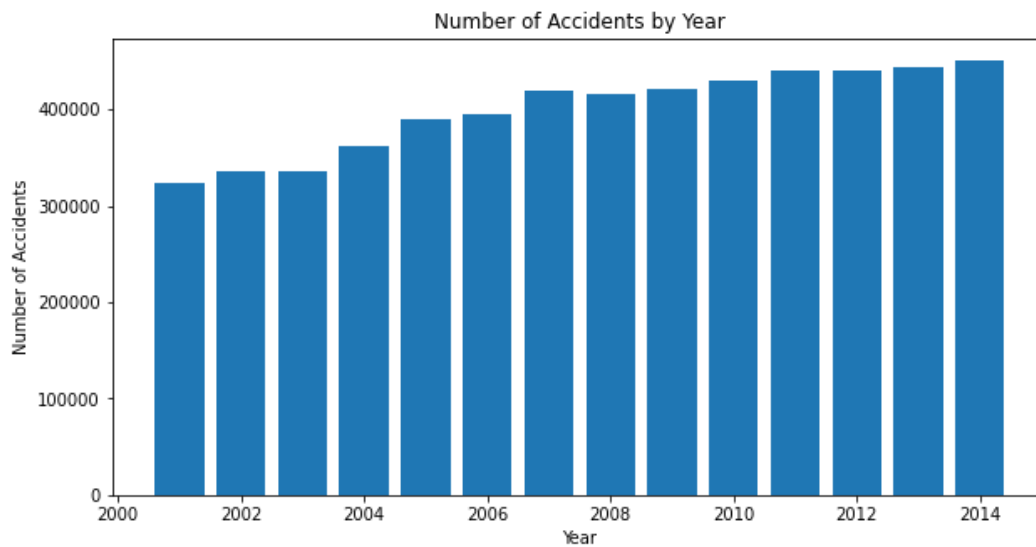**Output:**

6. Find no. of accidents happened in each year and show them using plots.

```
a=df.groupby(['YEAR'])['Total'].sum()
plt.bar(a.index,a.values)
plt.show()
```
**Output:**

Number of Accidents by Year

7. Find the states with least no. of accidents in all durations and draw plot to show the results

```
state_df = df.groupby('STATE/UT')['Total'].sum().reset_index()
# Sort the data by the total number of accidents in ascending order
state_df = state_df.sort_values(by='Total', ascending=True)
# Create a plot to show the results
plt.figure(figsize=(12, 6))
plt.bar(state_df['STATE/UT'], state_df['Total'])
plt.xticks(rotation=90)
plt.title('States with Least Number of Accidents in All Durations')
plt.xlabel('State')
plt.ylabel('Number of Accidents')
plt.show()
```
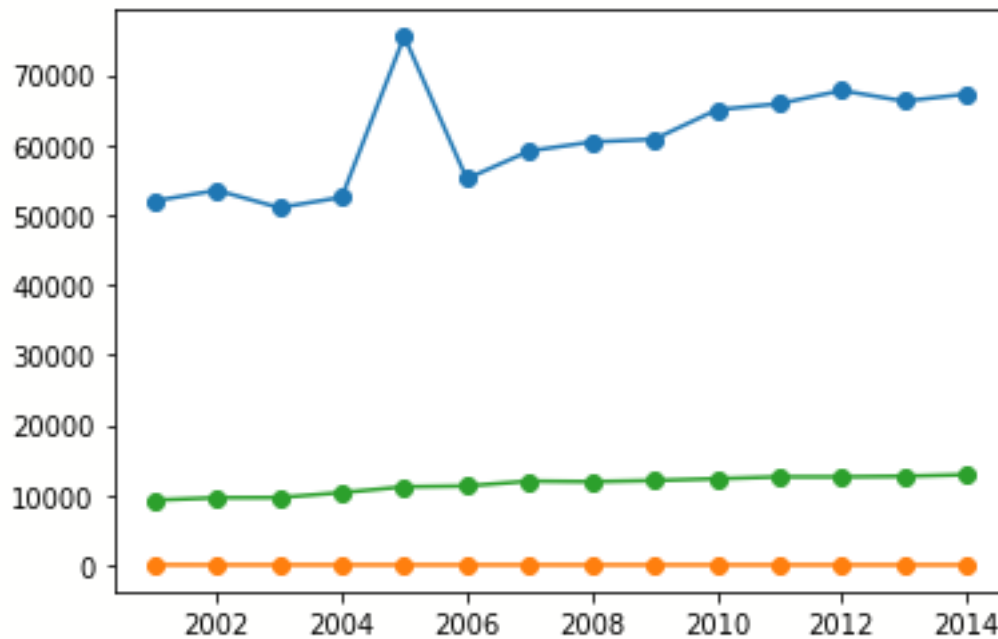
Output:

States with Least Number of Accidents in All Durations
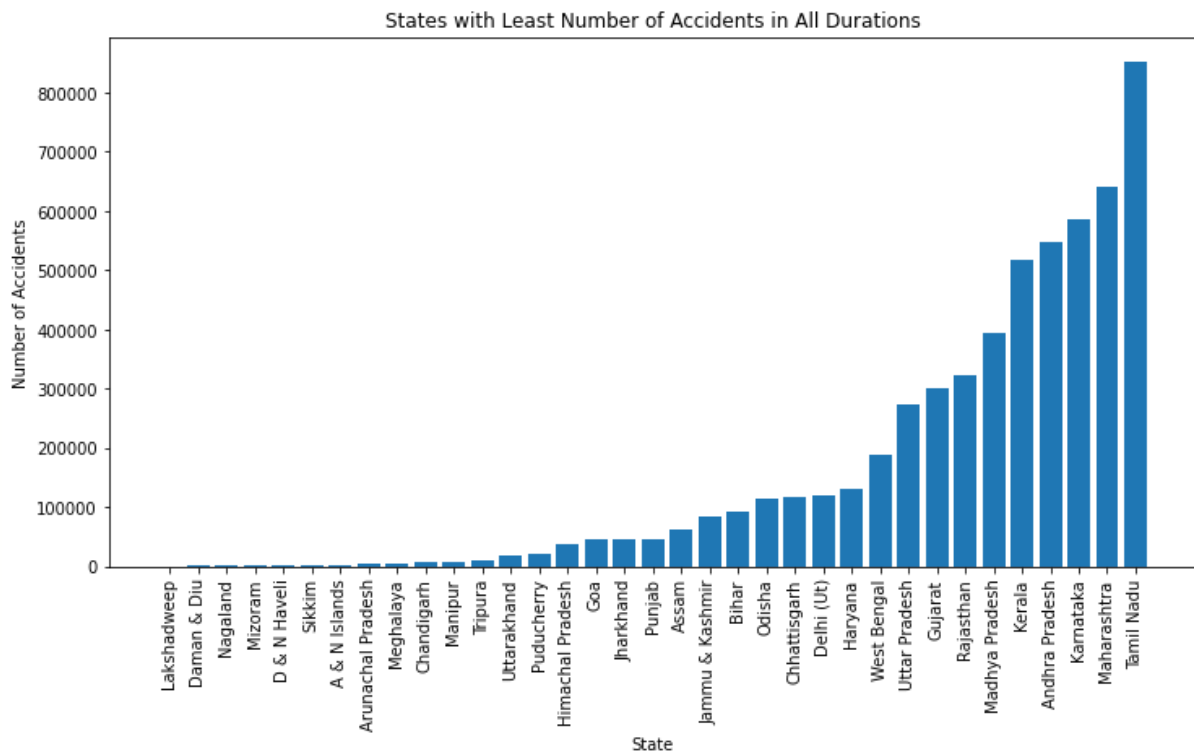
8.Find the maximum, minimum & average no. of accidents happened in each year and draw plot to show the results.

a=df.groupby(['YEAR'])['Total'].max()

b=df.groupby(['YEAR'])['Total'].min()

c=df.groupby(['YEAR'])['Total'].mean()

plt.plot(a,marker='o',label='max')

plt.plot(b,marker='o',label='min')

plt.plot(c,marker='o',label='mean')

plt.show()

Output:

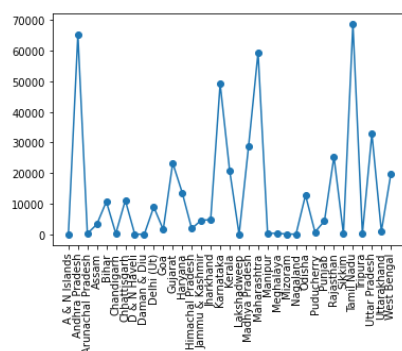**9.Find accidents happened in all states during 36 hours from 2001 to 2014 and draw plo t to show the results.**

df1=df.groupby('STATE/UT')['3-6 hrs. (Night)'].sum()

plt.plot(df1,'o-')

plt.xticks(rotation=90)

plt.show()

Output:

10.Find the max, min & average no. of accidents happened in every duration in each ye ar and draw plots for the states in top in each category.

```
#10
plt.subplot(3,1,1)
a=df.groupby('YEAR')[['0-3 hrs. (Night)']].max()
plt.plot(a,label='0-3 hrs',marker='o')
a=df.groupby('YEAR')[['3-6 hrs. (Night)']].max()
```

```python
plt.plot(a,label='3-6 hrs',marker='o')
a=df.groupby('YEAR')[['6-9 hrs (Day)']].max()
plt.plot(a,label='6-9 hrs',marker='o')
a=df.groupby('YEAR')[['9-12 hrs (Day)']].max()
plt.plot(a,label='0-3 hrs',marker='o')
a=df.groupby('YEAR')[['12-15 hrs (Day)']].max()
plt.plot(a,label='12-15 hrs',marker='o')
a=df.groupby('YEAR')[['15-18 hrs (Day)']].max()
plt.plot(a,label='15-18 hrs',marker='o')
a=df.groupby('YEAR')[['18-21 hrs (Night)']].max()
plt.plot(a,label='18-21 hrs',marker='o')
a=df.groupby('YEAR')[['21-24 hrs (Night)']].max()
plt.plot(a,label='21-24 hrs',marker='o')
plt.legend(bbox_to_anchor=(1.5,1),loc="upper right")
plt.subplot(3,1,2)
a=df.groupby('YEAR')[['0-3 hrs. (Night)']].min()
plt.plot(a,label='0-3 hrs',marker='o')
a=df.groupby('YEAR')[['3-6 hrs. (Night)']].min()
plt.plot(a,label='3-6 hrs',marker='o')
a=df.groupby('YEAR')[['6-9 hrs (Day)']].min()
plt.plot(a,label='6-9 hrs',marker='o')
a=df.groupby('YEAR')[['9-12 hrs (Day)']].min()
plt.plot(a,label='0-3 hrs',marker='o')
a=df.groupby('YEAR')[['12-15 hrs (Day)']].min()
plt.plot(a,label='12-15 hrs',marker='o')
a=df.groupby('YEAR')[['15-18 hrs (Day)']].min()
plt.plot(a,label='15-18 hrs',marker='o')
a=df.groupby('YEAR')[['18-21 hrs (Night)']].min()
plt.plot(a,label='18-21 hrs',marker='o')
a=df.groupby('YEAR')[['21-24 hrs (Night)']].min()
plt.plot(a,label='21-24 hrs',marker='o')
plt.legend(bbox_to_anchor=(1.5,1),loc="upper right")
plt.subplot(3,1,3)
a=df.groupby('YEAR')[['0-3 hrs. (Night)']].mean()
plt.plot(a,label='0-3 hrs',marker='o')
a=df.groupby('YEAR')[['3-6 hrs. (Night)']].mean()
plt.plot(a,label='3-6 hrs',marker='o')
a=df.groupby('YEAR')[['6-9 hrs (Day)']].mean()
plt.plot(a,label='6-9 hrs',marker='o')
a=df.groupby('YEAR')[['9-12 hrs (Day)']].mean()
plt.plot(a,label='0-3 hrs',marker='o')
a=df.groupby('YEAR')[['12-15 hrs (Day)']].mean()
plt.plot(a,label='12-15 hrs',marker='o')
a=df.groupby('YEAR')[['15-18 hrs (Day)']].mean()
plt.plot(a,label='15-18 hrs',marker='o')
a=df.groupby('YEAR')[['18-21 hrs (Night)']].mean()
plt.plot(a,label='18-21 hrs',marker='o')
```

```
a=df.groupby('YEAR')[['21-24 hrs (Night)']].mean()
plt.plot(a,label='21-24 hrs',marker='o')
plt.legend(bbox_to_anchor=(1.5,1),loc="upper right")
plt.show()
```

Output: