In [1]:
```
import pandas as pd
import numpy as np
import seaborn as sns
from matplotlib import pyplot as plt
import datetime as dt
```

In [2]:
```
df=pd.read_excel("C:\\Users\\Pranav\\Desktop\\DATA SCIENCE DATA\\Excel file\\covid_19_india.xlsx")
```

In [3]:
```
df.head()
```

Out[3]:

	Sno	Date	Time	State/UnionTerritory	ConfirmedIndianNational	ConfirmedForeignNational	Cured	Deaths	Confirmed
0	1	2020-01-30	18:00:00	Kerala	1	0	0	0	1
1	2	2020-01-31	18:00:00	Kerala	1	0	0	0	1
2	3	2020-02-01	18:00:00	Kerala	2	0	0	0	2
3	4	2020-02-02	18:00:00	Kerala	3	0	0	0	3
4	5	2020-02-03	18:00:00	Kerala	3	0	0	0	3

In [4]:
```
df=df[['Date','State/UnionTerritory','Cured','Deaths','Confirmed']]
df.columns=['Date','State','Cured','Deaths','Confirmed']
```

In [5]:
```
df.head()
```

Out[5]:

	Date	State	Cured	Deaths	Confirmed
0	2020-01-30	Kerala	0	0	1
1	2020-01-31	Kerala	0	0	1
2	2020-02-01	Kerala	0	0	2
3	2020-02-02	Kerala	0	0	3
4	2020-02-03	Kerala	0	0	3

In [6]:
```
df.tail()
```

Out[6]:

	Date	State	Cured	Deaths	Confirmed
796	2020-04-09	Telengana	35	7	442
797	2020-04-09	Tripura	0	0	1
798	2020-04-09	Uttarakhand	5	0	35
799	2020-04-09	Uttar Pradesh	31	4	410
800	2020-04-09	West Bengal	16	5	103

In [7]:
```
#to see any date data
today=df[df.Date=='2020-04-09']
```

In [8]:
```
today
```

Out[8]:

	Date	State	Cured	Deaths	Confirmed
770	2020-04-09	Andhra Pradesh	6	4	348
771	2020-04-09	Andaman and Nicobar Islands	0	0	11
772	2020-04-09	Arunachal Pradesh	0	0	1
773	2020-04-09	Assam	0	0	28
774	2020-04-09	Bihar	0	1	39
775	2020-04-09	Chandigarh	7	0	18
776	2020-04-09	Chhattisgarh	9	0	10
777	2020-04-09	Delhi	21	9	669
778	2020-04-09	Goa	0	0	7
779	2020-04-09	Gujarat	25	16	179
780	2020-04-09	Haryana	29	3	169
781	2020-04-09	Himachal Pradesh	2	1	18
782	2020-04-09	Jammu and Kashmir	4	4	158
783	2020-04-09	Jharkhand	0	0	13
784	2020-04-09	Karnataka	28	5	181
785	2020-04-09	Kerala	83	2	345
786	2020-04-09	Ladakh	10	0	14
787	2020-04-09	Madhya Pradesh	0	16	259
788	2020-04-09	Maharashtra	117	72	1135
789	2020-04-09	Manipur	1	0	2
790	2020-04-09	Mizoram	0	0	1
791	2020-04-09	Odisha	2	1	42
792	2020-04-09	Puducherry	1	0	5
793	2020-04-09	Punjab	4	8	101
794	2020-04-09	Rajasthan	21	3	383
795	2020-04-09	Tamil Nadu	21	8	738
796	2020-04-09	Telengana	35	7	442
797	2020-04-09	Tripura	0	0	1
798	2020-04-09	Uttarakhand	5	0	35
799	2020-04-09	Uttar Pradesh	31	4	410
800	2020-04-09	West Bengal	16	5	103

In [9]:
```
#to see the maximum cases in state at perticular date
max_confirmed_cases=today.sort_values(by="Confirmed",ascending=False)
```

In [10]:
```
max_confirmed_cases
```

Out[10]:

	Date	State	Cured	Deaths	Confirmed
788	2020-04-09	Maharashtra	117	72	1135
795	2020-04-09	Tamil Nadu	21	8	738
777	2020-04-09	Delhi	21	9	669
796	2020-04-09	Telengana	35	7	442
799	2020-04-09	Uttar Pradesh	31	4	410
794	2020-04-09	Rajasthan	21	3	383
770	2020-04-09	Andhra Pradesh	6	4	348
785	2020-04-09	Kerala	83	2	345
787	2020-04-09	Madhya Pradesh	0	16	259
784	2020-04-09	Karnataka	28	5	181
779	2020-04-09	Gujarat	25	16	179
780	2020-04-09	Haryana	29	3	169
782	2020-04-09	Jammu and Kashmir	4	4	158
800	2020-04-09	West Bengal	16	5	103
793	2020-04-09	Punjab	4	8	101
791	2020-04-09	Odisha	2	1	42
774	2020-04-09	Bihar	0	1	39
798	2020-04-09	Uttarakhand	5	0	35
773	2020-04-09	Assam	0	0	28
775	2020-04-09	Chandigarh	7	0	18
781	2020-04-09	Himachal Pradesh	2	1	18
786	2020-04-09	Ladakh	10	0	14
783	2020-04-09	Jharkhand	0	0	13
771	2020-04-09	Andaman and Nicobar Islands	0	0	11
776	2020-04-09	Chhattisgarh	9	0	10
778	2020-04-09	Goa	0	0	7
792	2020-04-09	Puducherry	1	0	5
789	2020-04-09	Manipur	1	0	2
797	2020-04-09	Tripura	0	0	1
790	2020-04-09	Mizoram	0	0	1
772	2020-04-09	Arunachal Pradesh	0	0	1

In [11]:
```
#to see the minimum cases in state at perticular date
min_confirmed_cases=today.sort_values(by="Confirmed",ascending=True)
```

In [12]:
```
min_confirmed_cases
```

Out[12]:

	Date	State	Cured	Deaths	Confirmed
772	2020-04-09	Arunachal Pradesh	0	0	1
790	2020-04-09	Mizoram	0	0	1
797	2020-04-09	Tripura	0	0	1
789	2020-04-09	Manipur	1	0	2
792	2020-04-09	Puducherry	1	0	5
778	2020-04-09	Goa	0	0	7
776	2020-04-09	Chhattisgarh	9	0	10
771	2020-04-09	Andaman and Nicobar Islands	0	0	11
783	2020-04-09	Jharkhand	0	0	13
786	2020-04-09	Ladakh	10	0	14
781	2020-04-09	Himachal Pradesh	2	1	18
775	2020-04-09	Chandigarh	7	0	18
773	2020-04-09	Assam	0	0	28
798	2020-04-09	Uttarakhand	5	0	35
774	2020-04-09	Bihar	0	1	39
791	2020-04-09	Odisha	2	1	42
793	2020-04-09	Punjab	4	8	101
800	2020-04-09	West Bengal	16	5	103
782	2020-04-09	Jammu and Kashmir	4	4	158
780	2020-04-09	Haryana	29	3	169
779	2020-04-09	Gujarat	25	16	179
784	2020-04-09	Karnataka	28	5	181
787	2020-04-09	Madhya Pradesh	0	16	259
785	2020-04-09	Kerala	83	2	345
770	2020-04-09	Andhra Pradesh	6	4	348
794	2020-04-09	Rajasthan	21	3	383
799	2020-04-09	Uttar Pradesh	31	4	410
796	2020-04-09	Telengana	35	7	442
777	2020-04-09	Delhi	21	9	669
795	2020-04-09	Tamil Nadu	21	8	738
788	2020-04-09	Maharashtra	117	72	1135

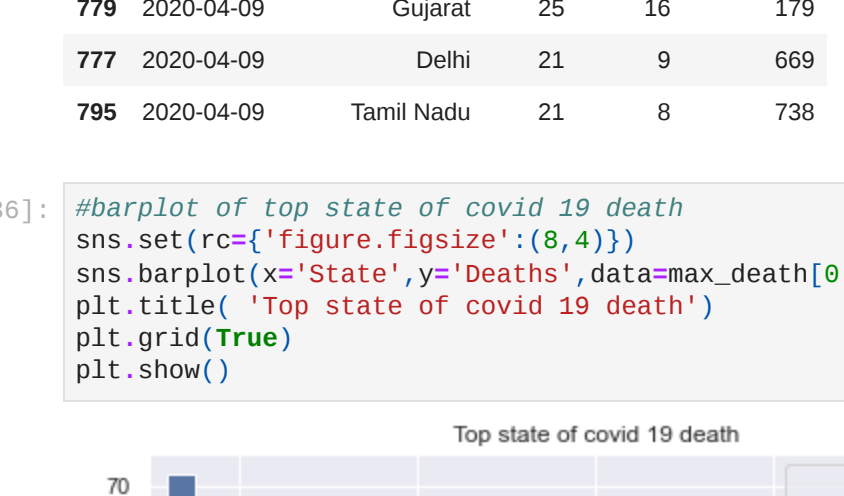
In [13]:
```
top_state_confirmed=max_confirmed_cases[0:5]
```

In [14]:
```
top_state_confirmed
```

Out[14]:

	Date	State	Cured	Deaths	Confirmed
788	2020-04-09	Maharashtra	117	72	1135
795	2020-04-09	Tamil Nadu	21	8	738
777	2020-04-09	Delhi	21	9	669
796	2020-04-09	Telengana	35	7	442
799	2020-04-09	Uttar Pradesh	31	4	410

In [37]:
```
#barplot of top state of covid 19
sns.set(rc={'figure.figsize':(7,4)})
sns.barplot(x='State',y='Confirmed',data=top_state_confirmed,hue='State')
plt.title( 'Top state of covid 19')
plt.grid(True)
plt.show()
```



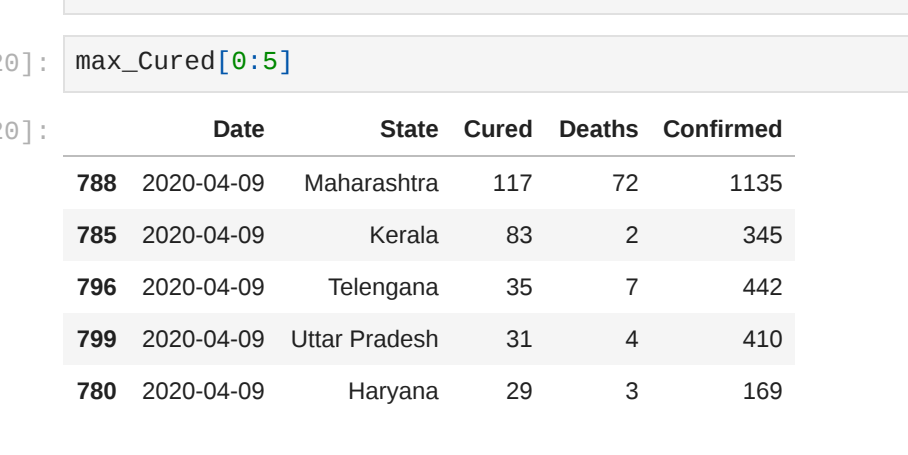
In [16]:
```
#to see the minimum death in state at perticular date
max_death=today.sort_values(by="Deaths",ascending=False)
```

In [17]:
```
max_death[0:5]
```

Out[17]:

	Date	State	Cured	Deaths	Confirmed
788	2020-04-09	Maharashtra	117	72	1135
787	2020-04-09	Madhya Pradesh	0	16	259
779	2020-04-09	Gujarat	25	16	179
777	2020-04-09	Delhi	21	9	669
795	2020-04-09	Tamil Nadu	21	8	738

In [36]:
```
#barplot of top state of covid 19 death
sns.set(rc={'figure.figsize':(8,4)})
sns.barplot(x='State',y='Deaths',data=max_death[0:5],hue='State')
plt.title( 'Top state of covid 19 death')
plt.grid(True)
plt.show()
```



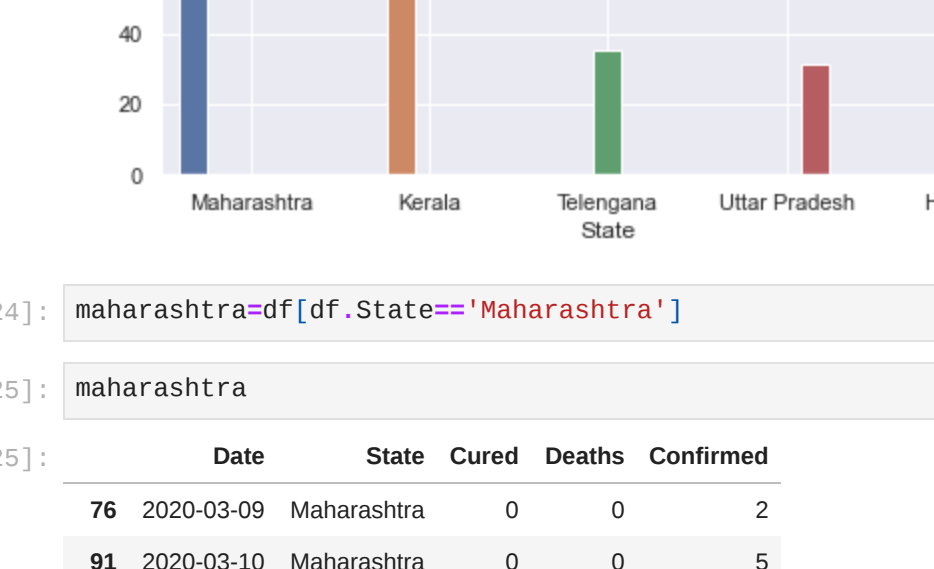
In [19]:
```
#to see the minimum Cured in state at perticular date
max_Cured=today.sort_values(by="Cured",ascending=False)
```

In [20]:
```
max_Cured[0:5]
```

Out[20]:

	Date	State	Cured	Deaths	Confirmed
788	2020-04-09	Maharashtra	117	72	1135
785	2020-04-09	Kerala	83	2	345
796	2020-04-09	Telengana	35	7	442
799	2020-04-09	Uttar Pradesh	31	4	410
780	2020-04-09	Haryana	29	3	169

In [35]:
```
#barplot of top state of covid 19 Cured
sns.set(rc={'figure.figsize':(8,4)})
sns.barplot(x='State',y='Cured',data=max_Cured[0:5],hue='State')
plt.title( 'Top state of covid 19 Cured')
plt.grid(True)
plt.show()
```



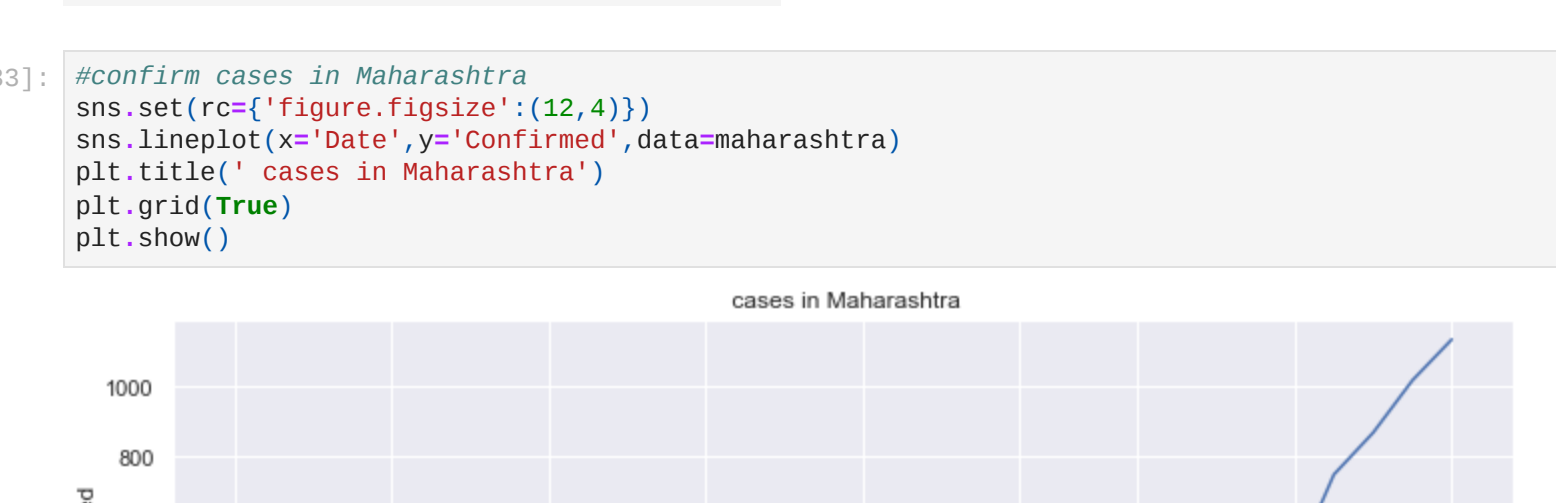
In [24]:
```
maharashtra=df[df.State=='Maharashtra']
```

In [25]:
```
maharashtra
```

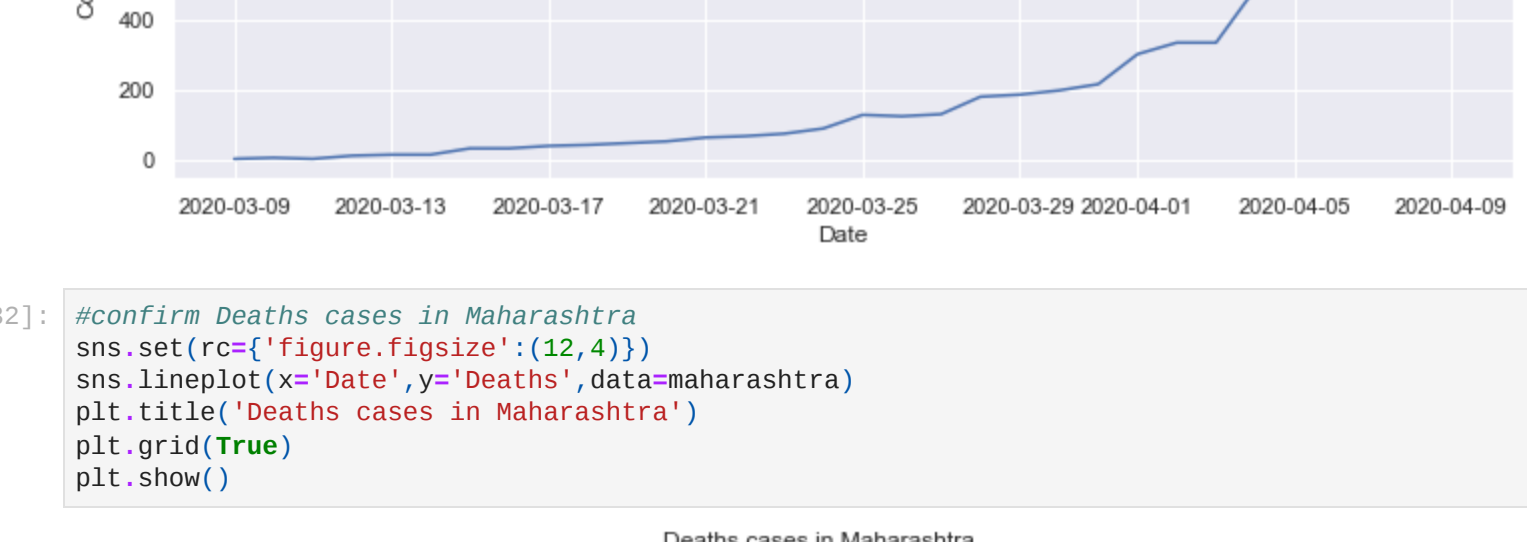
Out[25]:

	Date	State	Cured	Deaths	Confirmed
76	2020-03-09	Maharashtra	0	0	2
91	2020-03-10	Maharashtra	0	0	5
97	2020-03-11	Maharashtra	0	0	2
120	2020-03-12	Maharashtra	0	0	11
133	2020-03-13	Maharashtra	0	0	14
146	2020-03-14	Maharashtra	0	0	14
153	2020-03-15	Maharashtra	0	0	32
167	2020-03-16	Maharashtra	0	0	32
182	2020-03-17	Maharashtra	0	1	39
197	2020-03-18	Maharashtra	0	1	42
215	2020-03-19	Maharashtra	0	1	47
235	2020-03-20	Maharashtra	0	1	52
257	2020-03-21	Maharashtra	0	1	63
280	2020-03-22	Maharashtra	0	2	67
303	2020-03-23	Maharashtra	0	2	74
326	2020-03-24	Maharashtra	0	2	89
350	2020-03-25	Maharashtra	1	3	128
380	2020-03-26	Maharashtra	1	3	124
407	2020-03-27	Maharashtra	15	4	130
434	2020-03-28	Maharashtra	25	5	180
461	2020-03-29	Maharashtra	25	6	186
488	2020-03-30	Maharashtra	25	8	198
516	2020-03-31	Maharashtra	39	9	216
546	2020-04-01	Maharashtra	39	9	302
575	2020-04-02	Maharashtra	42	13	335
605	2020-04-03	Maharashtra	42	16	335
636	2020-04-04	Maharashtra	42	24	490
666	2020-04-05	Maharashtra	42	24	490
696	2020-04-06	Maharashtra	56	45	748
726	2020-04-07	Maharashtra	56	48	868
757	2020-04-08	Maharashtra	79	64	1018
788	2020-04-09	Maharashtra	117	72	1135

In [33]:
```
#confirm cases in Maharashtra
sns.set(rc={'figure.figsize':(12,4)})
sns.lineplot(x='Date',y='Confirmed',data=maharashtra)
plt.title(' cases in Maharashtra')
plt.grid(True)
plt.show()
```



In [32]:
```
#confirm Deaths cases in Maharashtra
sns.set(rc={'figure.figsize':(12,4)})
sns.lineplot(x='Date',y='Deaths',data=maharashtra)
plt.title('Deaths cases in Maharashtra')
plt.grid(True)
plt.show()
```



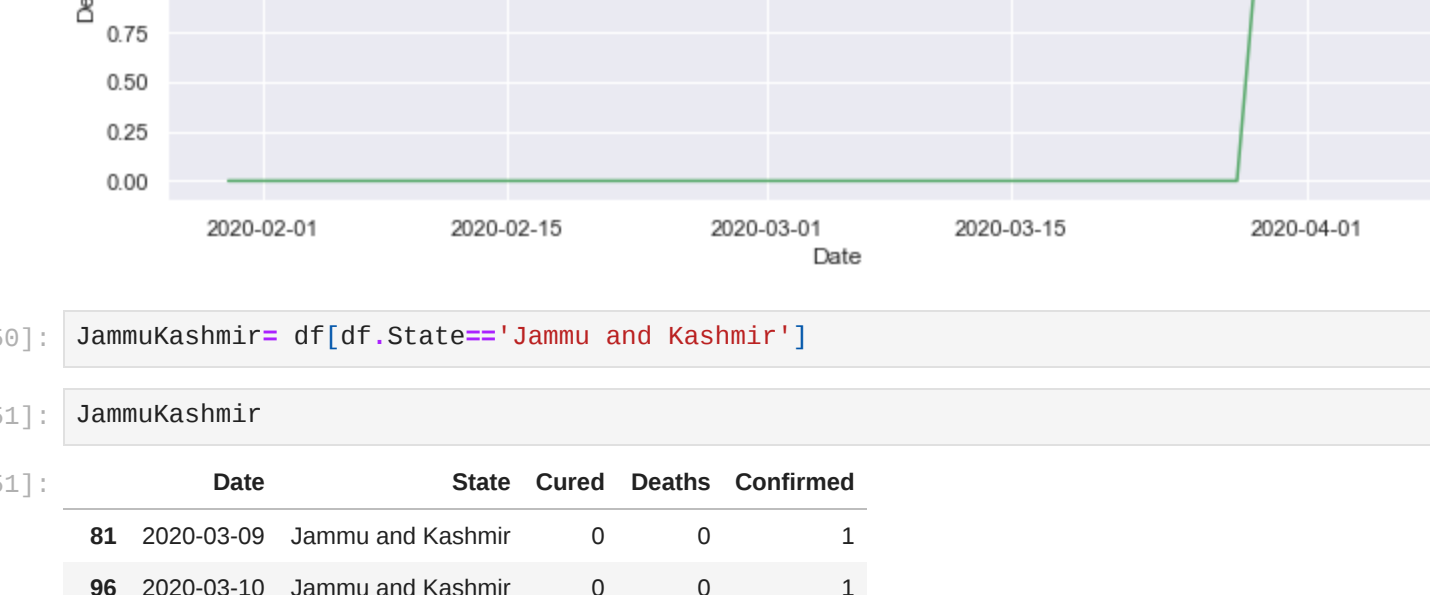
In [40]:
```
Kerala=df[df.State=='Kerala']
Kerala
```

Out[40]:

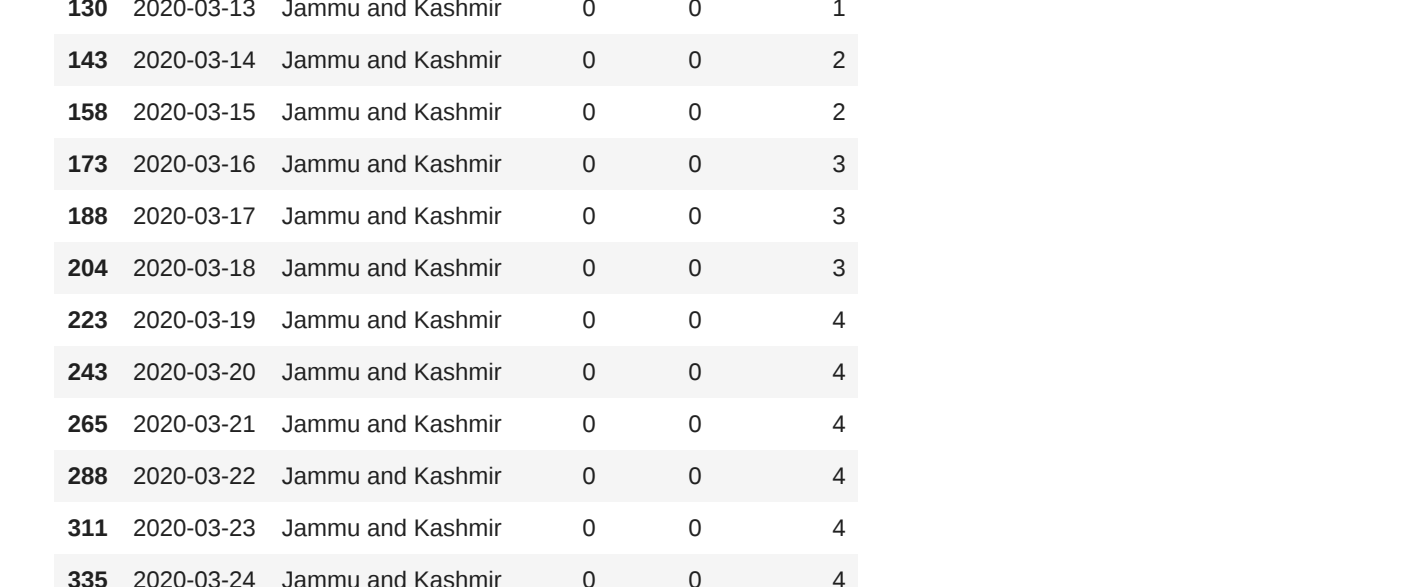
	Date	State	Cured	Deaths	Confirmed
0	2020-01-30	Kerala	0	0	1
1	2020-01-31	Kerala	0	0	1
2	2020-02-01	Kerala	0	0	2
3	2020-02-02	Kerala	0	0	3
4	2020-02-03	Kerala	0	0	3
...	...	...	...	...	...
663	2020-04-05	Kerala	49	2	306
693	2020-04-06	Kerala	55	2	314
723	2020-04-07	Kerala	58	2	327
754	2020-04-08	Kerala	70	2	336
785	2020-04-09	Kerala	83	2	345

71 rows × 5 columns

In [52]:
```
#confirm cases in Kerala
sns.set(rc={'figure.figsize':(12,4)})
sns.lineplot(x='Date',y='Confirmed',data=Kerala,color='g')
plt.title(' cases in Kerala')
plt.grid(True)
plt.show()
```



In [53]:
```
#confirm Deaths cases in Kerala
sns.set(rc={'figure.figsize':(12,4)})
sns.lineplot(x='Date',y='Deaths',data=Kerala,color='g')
plt.title('Deaths cases in Kerala')
plt.grid(True)
plt.show()
```



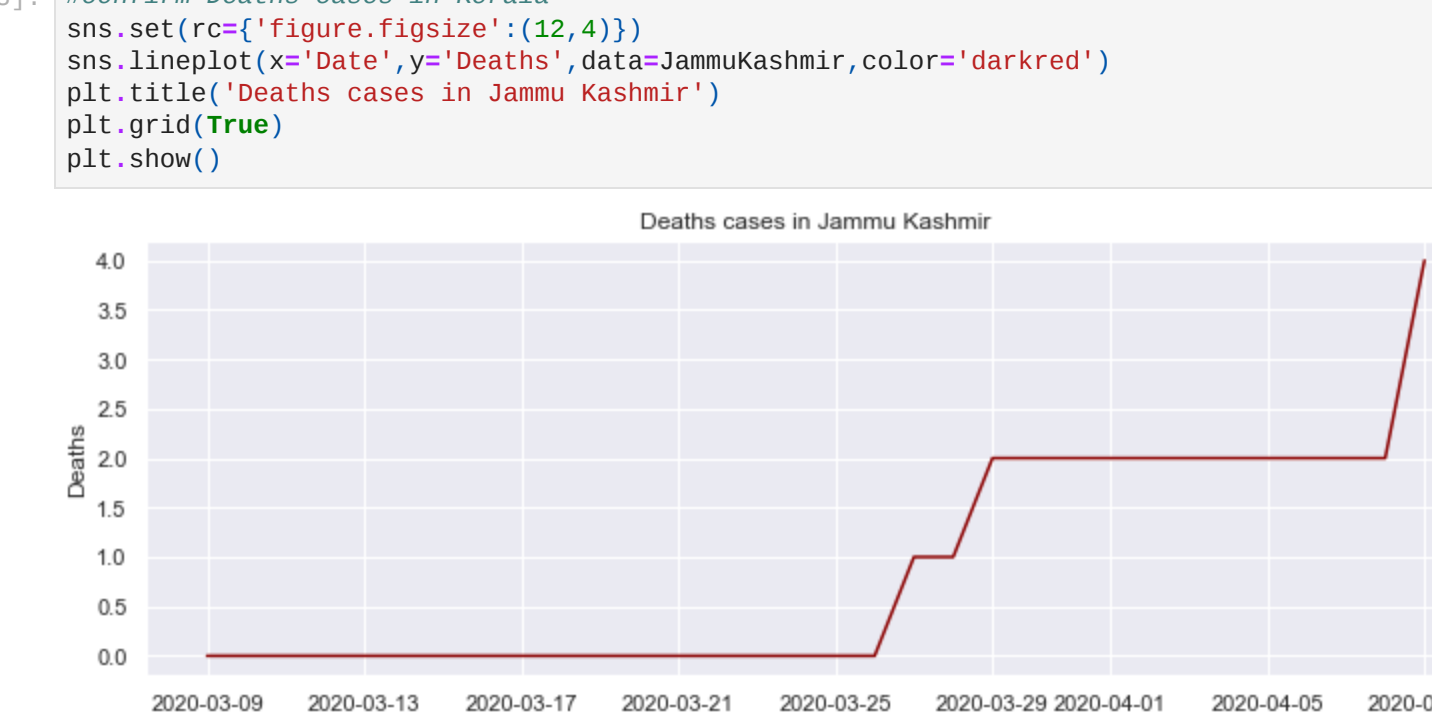
In [50]:
```
JammuKashmir= df[df.State=='Jammu and Kashmir']
```

In [51]:
```
JammuKashmir
```

Out[51]:

	Date	State	Cured	Deaths	Confirmed
81	2020-03-09	Jammu and Kashmir	0	0	1
96	2020-03-10	Jammu and Kashmir	0	0	1
106	2020-03-11	Jammu and Kashmir	0	0	1
117	2020-03-12	Jammu and Kashmir	0	0	1
130	2020-03-13	Jammu and Kashmir	0	0	1
143	2020-03-14	Jammu and Kashmir	0	0	2
158	2020-03-15	Jammu and Kashmir	0	0	2
173	2020-03-16	Jammu and Kashmir	0	0	3
188	2020-03-17	Jammu and Kashmir	0	0	3
204	2020-03-18	Jammu and Kashmir	0	0	3
223	2020-03-19	Jammu and Kashmir	0	0	4
243	2020-03-20	Jammu and Kashmir	0	0	4
265	2020-03-21	Jammu and Kashmir	0	0	4
288	2020-03-22	Jammu and Kashmir	0	0	4
311	2020-03-23	Jammu and Kashmir	0	0	4
335	2020-03-24	Jammu and Kashmir	0	0	4
360	2020-03-25	Jammu and Kashmir	1	0	7
375	2020-03-26	Jammu and Kashmir	1	0	13
402	2020-03-27	Jammu and Kashmir	1	1	13
429	2020-03-28	Jammu and Kashmir	1	1	20
456	2020-03-29	Jammu and Kashmir	1	2	31
483	2020-03-30	Jammu and Kashmir	2	2	48
511	2020-03-31	Jammu and Kashmir	2	2	54
540	2020-04-01	Jammu and Kashmir	2	2	62
569	2020-04-02	Jammu and Kashmir	2	2	62
599	2020-04-03	Jammu and Kashmir	3	2	75
630	2020-04-04	Jammu and Kashmir	3	2	75
660	2020-04-05	Jammu and Kashmir	4	2	106
690	2020-04-06	Jammu and Kashmir	4	2	109
720	2020-04-07	Jammu and Kashmir	4	2	116
751	2020-04-08	Jammu and Kashmir	4	2	116
782	2020-04-09	Jammu and Kashmir	4	4	158

In [57]:
```
#confirm cases in Kerala
sns.set(rc={'figure.figsize':(12,4)})
sns.lineplot(x='Date',y='Confirmed',data=JammuKashmir,color='darkred')
plt.title(' cases in Jammu Kashmir')
plt.grid(True)
plt.show()
```



In [58]:
```
#confirm Deaths cases in Kerala
sns.set(rc={'figure.figsize':(12,4)})
sns.lineplot(x='Date',y='Deaths',data=JammuKashmir,color='darkred')
plt.title('Deaths cases in Jammu Kashmir')
plt.grid(True)
plt.show()
```

In [59]:
```
#liner regression
from sklearn.model_selection import train_test_split
```

In [60]:
```
maharashtra
```

Out[60]:

	Date	State	Cured	Deaths	Confirmed
76	2020-03-09	Maharashtra	0	0	2
91	2020-03-10	Maharashtra	0	0	5
97	2020-03-11	Maharashtra	0	0	2
120	2020-03-12	Maharashtra	0	0	11
133	2020-03-13	Maharashtra	0	0	14
146	2020-03-14	Maharashtra	0	0	14
153	2020-03-15	Maharashtra	0	0	32
167	2020-03-16	Maharashtra	0	0	32
182	2020-03-17	Maharashtra	0	1	39
197	2020-03-18	Maharashtra	0	1	42
215	2020-03-19	Maharashtra	0	1	47
235	2020-03-20	Maharashtra	0	1	52
257	2020-03-21	Maharashtra	0	1	63
280	2020-03-22	Maharashtra	0	2	67
303	2020-03-23	Maharashtra	0	2	74
326	2020-03-24	Maharashtra	0	2	89
350	2020-03-25	Maharashtra	1	3	128
380	2020-03-26	Maharashtra	1	3	124
407	2020-03-27	Maharashtra	15	4	130
434	2020-03-28	Maharashtra	25	5	180
461	2020-03-29	Maharashtra	25	6	186
488	2020-03-30	Maharashtra	25	8	198
516	2020-03-31	Maharashtra	39	9	216
546	2020-04-01	Maharashtra	39	9	302
575	2020-04-02	Maharashtra	42	13	335
605	2020-04-03	Maharashtra	42	16	335
636	2020-04-04	Maharashtra	42	24	490
666	2020-04-05	Maharashtra	42	24	490
696	2020-04-06	Maharashtra	56	45	748
726	2020-04-07	Maharashtra	56	48	868
757	2020-04-08	Maharashtra	79	64	1018
788	2020-04-09	Maharashtra	117	72	1135

In [62]:
```
maharashtra['Date']=maharashtra['Date'].map(dt.datetime.toordinal)
maharashtra.head()
```

Out[62]:

	Date	State	Cured	Deaths	Confirmed
76	2020-03-09	Maharashtra	0	0	2
91	2020-03-10	Maharashtra	0	0	5
97	2020-03-11	Maharashtra	0	0	2
120	2020-03-12	Maharashtra	0	0	11
133	2020-03-13	Maharashtra	0	0	14

In [64]:
```
X=maharashtra['Date']
y=maharashtra['Confirmed']
```

In [71]:
```
X_train,X_test,y_train,y_test=train_test_split(X,y,test_size=0.2)
```

In [72]:
```
print("shape of X_train= ",X_train.shape)
print("shape of X_test= ",X_test.shape)
print("shape of y_train= ",y_train.shape)
print("shape of y_test= ",y_test.shape)
```

```
shape of X_train=  (25,)
shape of X_test=  (7,)
shape of y_train=  (25,)
shape of y_test=  (7,)
```

In [73]:
```
from sklearn.linear_model import LinearRegression
```

In [74]:
```
model=LinearRegression()
model.fit(np.array(X_train).reshape(-1,1),np.array(y_train).reshape(-1,1))
```

Out[74]:
```
LinearRegression()
```

In [75]:
```
maharashtra.tail()
```

Out[75]:

	Date	State	Cured	Deaths	Confirmed
666	2020-04-05	Maharashtra	42	24	490
696	2020-04-06	Maharashtra	56	45	748
726	2020-04-07	Maharashtra	56	48	868
757	2020-04-08	Maharashtra	79	64	1018
788	2020-04-09	Maharashtra	117	72	1135

In [78]:
```
model.predict(np.array([[2020-4-09]]))
```

Out[78]:
```
array([[-497036.15943815]])
```

In [ ]: