

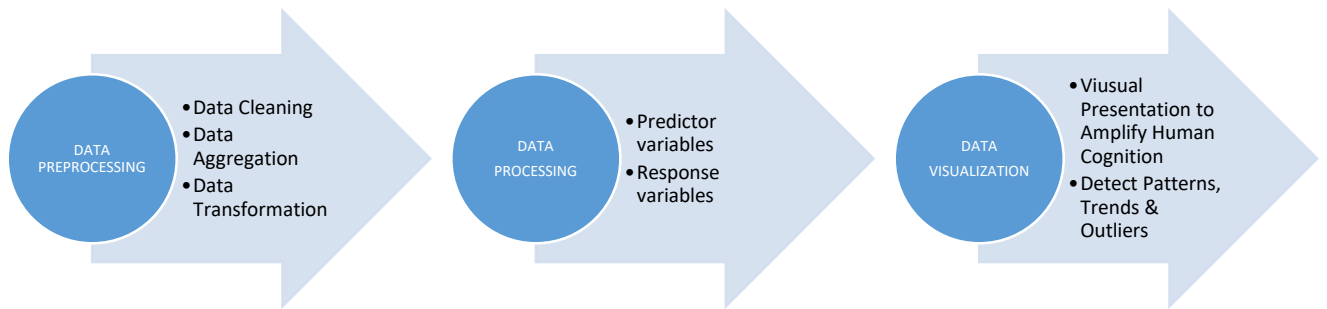
DSL810 - ASSIGNMENT #3

SECOND WAVE OF COVID19 in EUROPE – PROGRAMMING DEBUT USING MATLAB

SOFTWARE USED : MATLAB

DATA : Downloaded from “https://github.com/CSSEGISandData/COVID-19/tree/master/csse_covid_19_data”

ASSIGNMENT INTEND

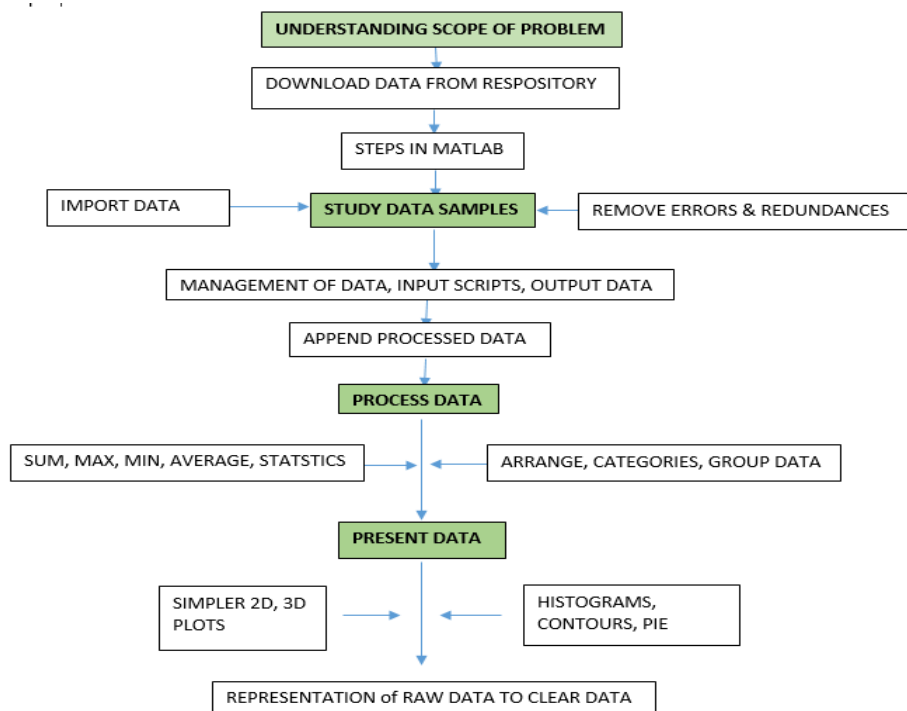


STEPS INVOLVED FROM RAW DATA TO FINAL PRESENTATION

Objective:

1. Europe hit by the second wave of Covid-19?

Can you validate this with the covid-19 datasets that you have or downloading fresh data from [CSSE git repository](https://github.com/CSSEGISandData/COVID-19)? Please show the analysis using a time series plot (no. of deaths vs. day from 1st April till now). Please also find out if this is the case in your State as well. Show the visuals and the insights. Please also upload your live script(s) properly commented with the assignment.



```
COVID19_EUROPE.mlx
disp('Data extraction code for C0vid19-Europe');
```

```
%datestr(now)
%sessionstart=datetime('now');
%tic
```

DEFINING GLOBAL VARIABLES

```
%defining global variables
global abspath datapath scriptpath datasetspath;
```

DEFINING PATHS-FOR FOLDERS

```
%path of the folder
abspath='/MATLAB Drive/';

%path for the raw data from Jhudata
datapath=strcat(abspath,'jhudata/');

%path where the scripts are kept
scriptpath=strcat(abspath,'scripts/');

%path where the results are kept
datasetspath=strcat(abspath,'datasetsEU/');
```

ADDING PATHS FOR ORGANISED FILE STORING APPROACH

```
addpath(scriptpath);
addpath(datapath);
addpath(datasetspath);
```

SCREENING OUT UNWANTED DATA

```
%s1allFiles = dir(datapath);
%s1allFileNames = {s1allFiles.name};
%if size(s1allFileNames,2) > 1
%s1allFileNames=transpose(s1allFileNames);
%end
%save('/MATLAB Drive/datasetsEU/covid19FileNamesEU.mat','s1allFileNames');
%save(strcat(datasetspath,'test5.mat'),'s1allFileNames');
```

INTERESTING PART

Appending All Files

```
s1numFiles=numel(s1allFileNames);%gives you number of Files
covid19_data=importFile(strcat(datapath,s1allFileNames{1}));
```

importFile.mat is Created by MATLAB itself for the sets of Actions performed by us in Importing first set of files.

Providing For Loop for Summing up data

```
for i = 2:s1numFiles
s1FileNamei=s1allFileNames{i};
covid19_data_onefile = importFile(strcat(datapath,s1FileNamei));
covid19_data=vertcat(covid19_data,covid19_data_onefile);
end
```

UPDATING DATA TYPES

```
covid19_data2 = convertvars(covid19_data, 'Last_Update', @string);
covid19_data2.Last_Update=datetime(covid19_data2.Last_Update, 'InputFormat', 'yy-MM-dd HH:mm:ss');
%save('/MATLAB Drive/datasetsEU/covid19_data2EU.mat', 'covid19_data2');
```

SETTING BOUNDARIES

```
covid19_data3=covid19_data2(covid19_data2.Deaths>=0,:); %Death not negative
covid19_data4=covid19_data3(covid19_data3.Active>=0,:); %Active not negative
covid19_data5=covid19_data4(covid19_data4.Recovered>=0,:);%Recovery not negative
covid19_data6=covid19_data5(covid19_data5.Confirmed>=0,:);%Confirmed not negative
covid19_data7=covid19_data6(covid19_data6.Lat>=-90,:); %Setting Latitude
covid19_data8=covid19_data7(covid19_data7.Long_>=-180,:); %Setting Longitude
```

Removing Weeds

```
covid19_data9 =
varfun(@max,covid19_data8, 'GroupingVariables', {'Country_Region', 'Province_State', 'Last_Update'}, ...
'InputVariables', {'Lat', 'Long_', 'Confirmed', 'Deaths', 'Active', 'Recovered', 'Incident_Rate', 'Case_Fatality_Ratio'});
%Grouping the Variables and setting InputVariables to workon

covid19_data10 = removevars(covid19_data9, {'GroupCount'});%Removing Groupcount
```

Get the Covid-19 data for GERMANY, UK, ITALY, SPAIN, SWITZ, FRANCE

```
covid19_data8_GE=covid19_data10(covid19_data10.Country_Region == 'Germany',:);
covid19_data8_UK=covid19_data10(covid19_data10.Country_Region == 'United Kingdom',:);
covid19_data8_IT=covid19_data10(covid19_data10.Country_Region == 'Italy',:);
covid19_data8_SP=covid19_data10(covid19_data10.Country_Region == 'Spain',:);
covid19_data8_SW=covid19_data10(covid19_data10.Country_Region == 'Switzerland',:);
covid19_data8_FR=covid19_data10(covid19_data10.Country_Region == 'France',:);
%From the Complete world Data , filtering Data for Countries of Interest
```

To Plot Max Active Cases & Death Cases

Removing Provinces

```

Covid_GE1=removevars(covid19_data8_GE,{'Province_State'});
Covid_UK1=removevars(covid19_data8_UK,{'Province_State'});
Covid_IT1=removevars(covid19_data8_IT,{'Province_State'});
Covid_SP1=removevars(covid19_data8_SP,{'Province_State'});
Covid_SW1=removevars(covid19_data8_SW,{'Province_State'});
Covid_FR1=removevars(covid19_data8_FR,{'Province_State'});

```

Now, Summing up maximums for a country region, for respective dates, considering only Active Cases & Death & Recovered.

```

Covid_GER=varfun(@sum,covid19_data8_GE,'GroupingVariables',{'Country_Region','Last_Update'},'InputVariables',{'max_Deaths','max_Active','max_Recovered'});
Covid_UnK=varfun(@sum,covid19_data8_UK,'GroupingVariables',{'Country_Region','Last_Update'},'InputVariables',{'max_Deaths','max_Active','max_Recovered'});
Covid_ITY=varfun(@sum,covid19_data8_IT,'GroupingVariables',{'Country_Region','Last_Update'},'InputVariables',{'max_Deaths','max_Active','max_Recovered'});
Covid_SPN=varfun(@sum,covid19_data8_SP,'GroupingVariables',{'Country_Region','Last_Update'},'InputVariables',{'max_Deaths','max_Active','max_Recovered'});
Covid_SWZ=varfun(@sum,covid19_data8_SW,'GroupingVariables',{'Country_Region','Last_Update'},'InputVariables',{'max_Deaths','max_Active','max_Recovered'});
Covid_FRA=varfun(@sum,covid19_data8_FR,'GroupingVariables',{'Country_Region','Last_Update'},'InputVariables',{'max_Deaths','max_Active','max_Recovered'});

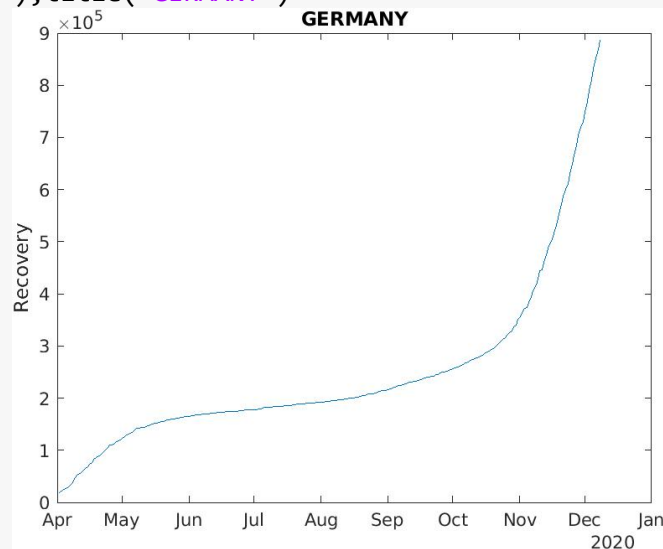
```

Plotting 2D Graphs

```

plot(Covid_GER.Last_Update,Covid_GER.sum_max_Recovered)
ylabel('Recovered');title('GERMANY')

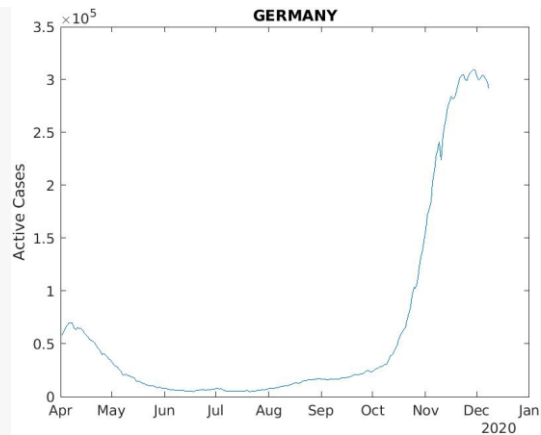
```



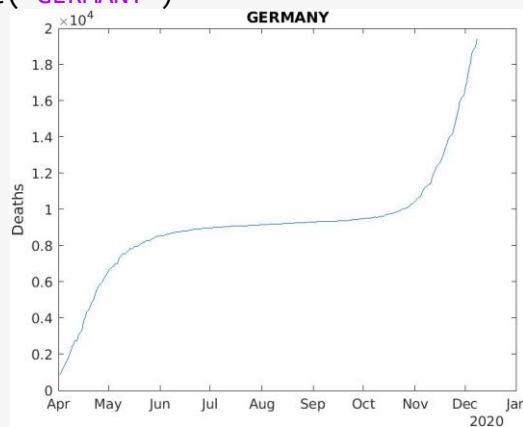
```

plot(Covid_GER.Last_Update,Covid_GER.sum_max_Active)
ylabel('Active cases');title('GERMANY')

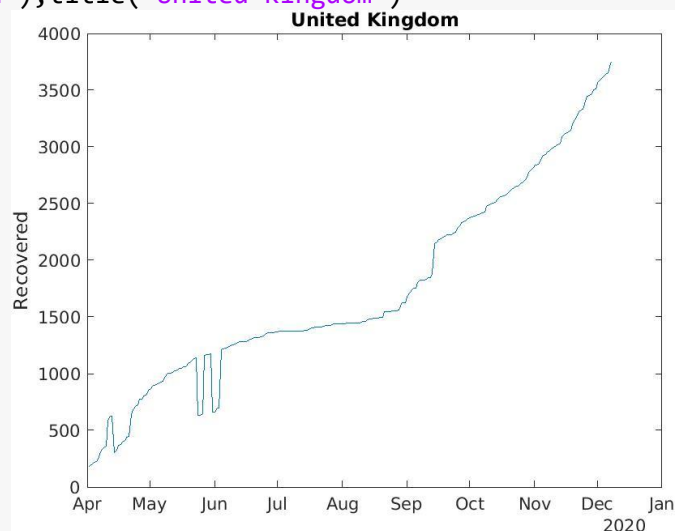
```



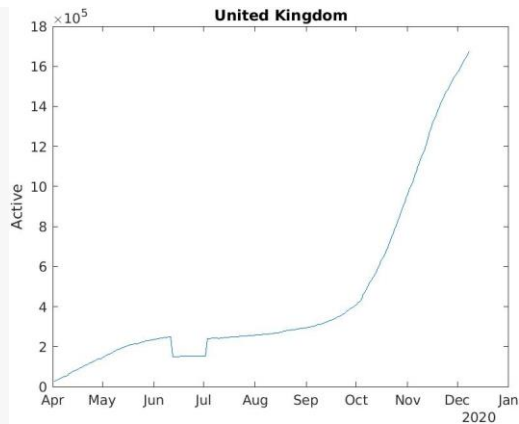
```
plot(Covid_GER.Last_Update,Covid_GER.sum_max_Deaths);
ylabel('Deaths');title('GERMANY')
```



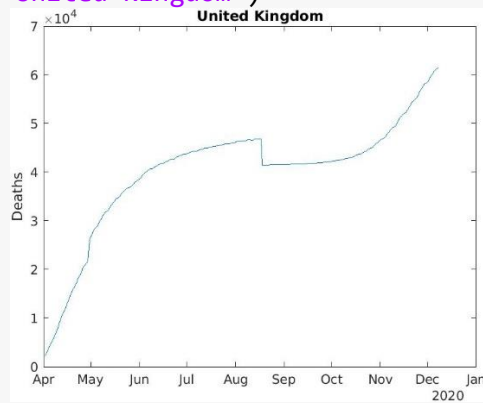
```
plot(Covid_UnK.Last_Update,Covid_UnK.sum_max_Recovered)
ylabel('Recovered');title('United Kingdom')
```



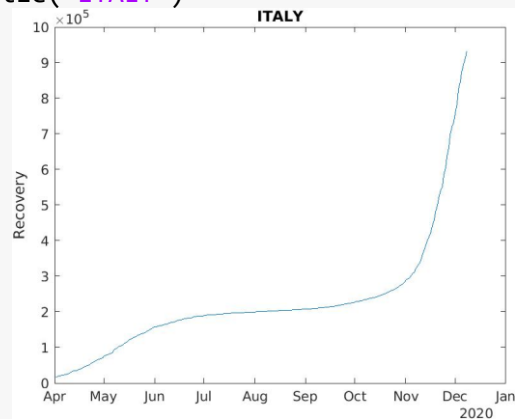
```
plot(Covid_UnK.Last_Update,Covid_UnK.sum_max_Active)
ylabel('Active cases');title('United Kingdom')
```



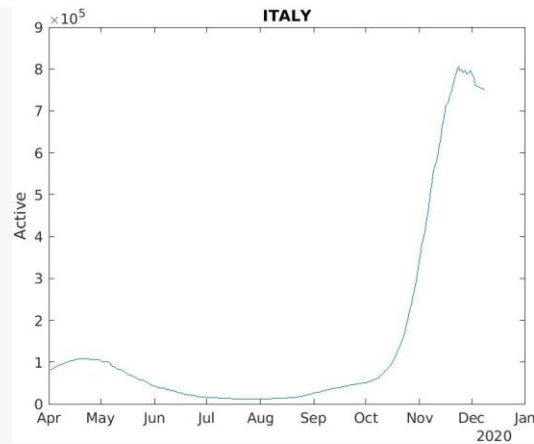
```
plot(Covid_UnK.Last_Update,Covid_UnK.sum_max_Deaths);
ylabel('Deaths');title('United Kingdom')
```



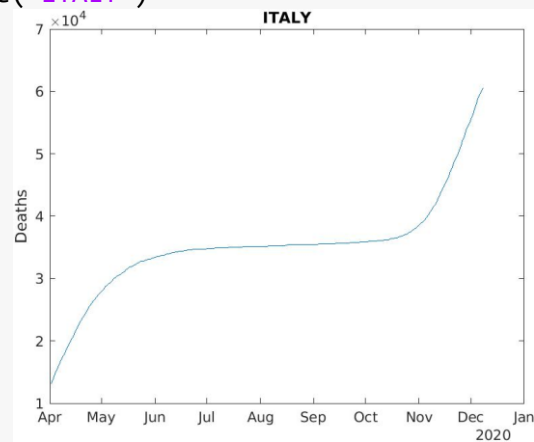
```
plot(Covid_ITY.Last_Update,Covid_ITY.sum_max_Recovered)
ylabel('Recovered');title('ITALY')
```



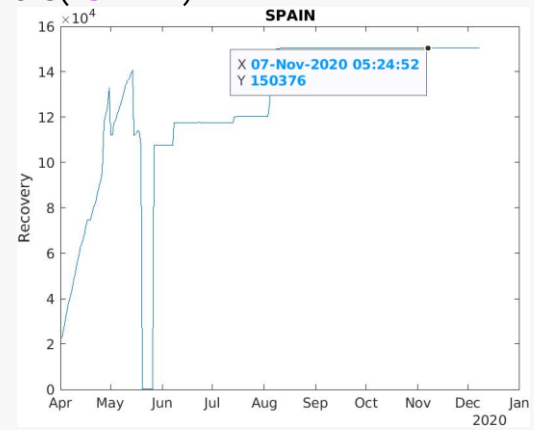
```
plot(Covid_ITY.Last_Update,Covid_ITY.sum_max_Active)
ylabel('Active cases');title('ITALY')
```



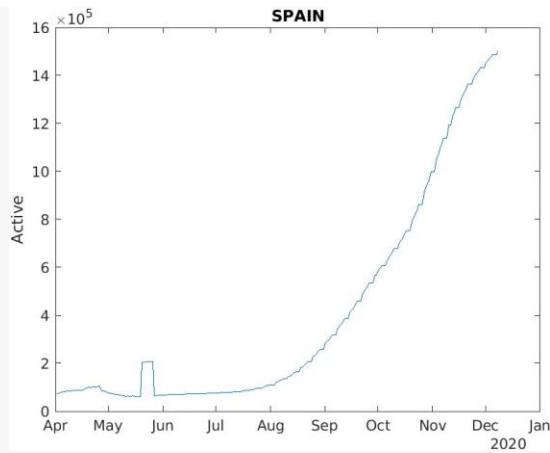
```
plot(Covid_ITY.Last_Update,Covid_ITY.sum_max_Deaths);
ylabel('Deaths');title('ITALY')
```



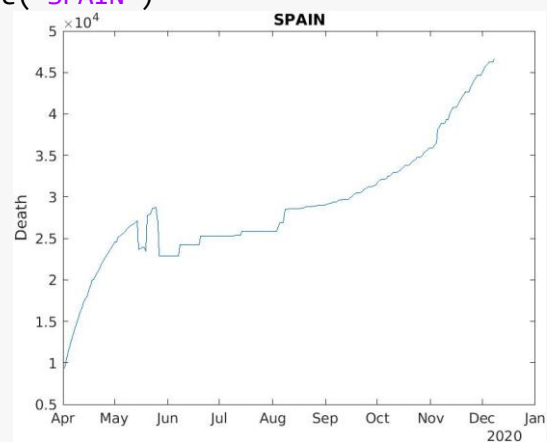
```
plot(Covid_SPN.Last_Update,Covid_SPN.sum_max_Recovered)
ylabel('Recovered');title('SPAIN')
```



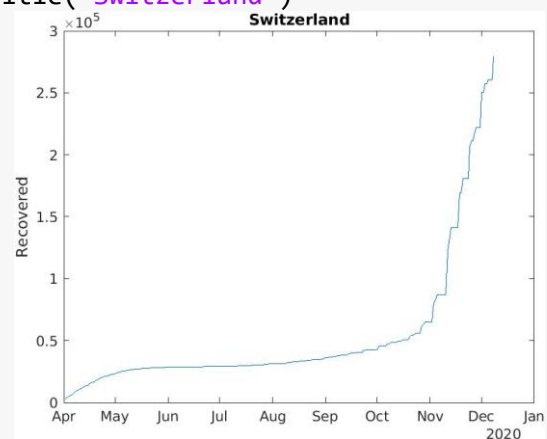
```
plot(Covid_SPN.Last_Update,Covid_SPN.sum_max_Active)
ylabel('Active cases');title('SPAIN')
```



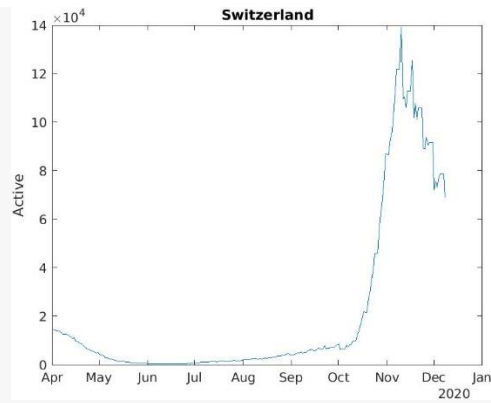
```
plot(Covid_SPN.Last_Update,Covid_SPN.sum_max_Deaths);
ylabel('Deaths');title('SPAIN')
```



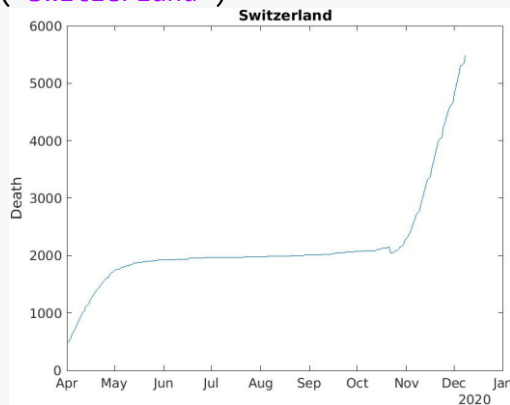
```
plot(Covid_SWZ.Last_Update,Covid_SWZ.sum_max_Recovered)
ylabel('Recovered');title('Switzerland')
```



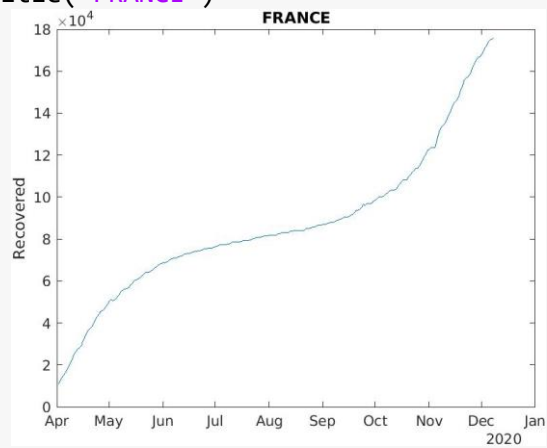
```
plot(Covid_SWZ.Last_Update,Covid_SWZ.sum_max_Active)
ylabel('Active cases');title('Switzerland')
```

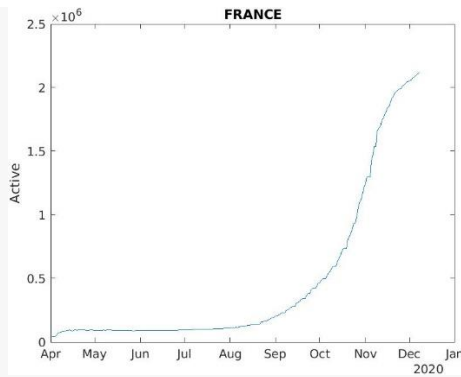
```
plot(Covid_SWZ.Last_Update,Covid_SWZ.sum_max_Deaths);
ylabel('Deaths');title('Switzerland')
```



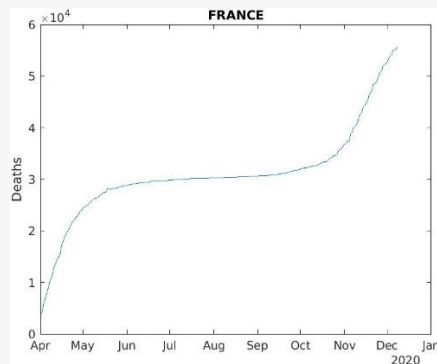
```
plot(Covid_FRA.Last_Update,Covid_FRA.sum_max_Recovered)
ylabel('Recovered');title('FRANCE')
```



```
plot(Covid_FRA.Last_Update,Covid_FRA.sum_max_Active)
ylabel('Active cases');title('FRANCE')
```



```
plot(Covid_FRA.Last_Update,Covid_FRA.sum_max_Deaths);
ylabel('Deaths');title('FRANCE')
```

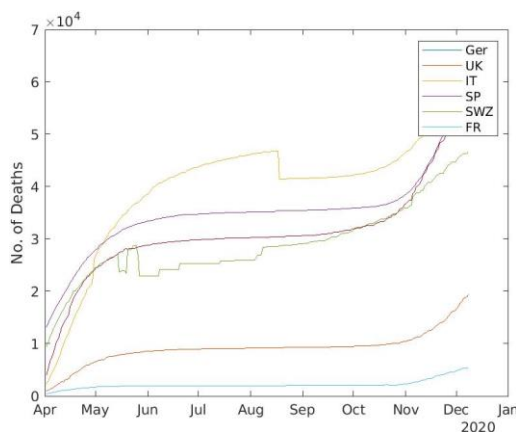


Combined Plots for European Countries

Plotting only Active Cases & no. of Death to Show the Impact of Second Wave.

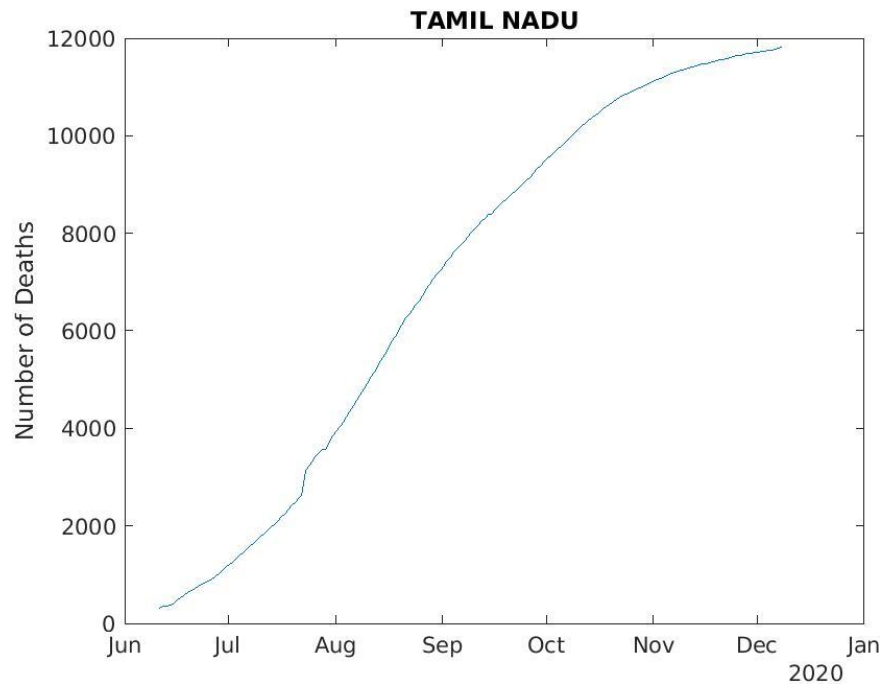
```
plot(Covid_GER.Last_Update,Covid_GER.sum_max_Deaths);ylabel('No. of Deaths');legend('show');legend('Ger'); hold on;
plot(Covid_UnK.Last_Update,Covid_UnK.sum_max_Deaths);ylabel('No. of Deaths');
plot(Covid_ITY.Last_Update,Covid_ITY.sum_max_Deaths);ylabel('No. of Deaths');
plot(Covid_SPN.Last_Update,Covid_SPN.sum_max_Deaths);ylabel('No. of Deaths');
plot(Covid_SWZ.Last_Update,Covid_SWZ.sum_max_Deaths);ylabel('No. of Deaths');
plot(Covid_FRA.Last_Update,Covid_FRA.sum_max_Deaths);ylabel('No. of Deaths');
legend('show');(legend('Ger','UK','IT','SP','SWZ','FR'));
```

FROM THE GRAPHS IT IS VERY MUCH CLEAR THAT EUROPE IS HARBOURING SECOND WAVE OF COVID19:



Coming to TamilNadu; A State in India,

```
covid19_data8_IN=covid19_data10(covid19_data10.Country_Region == 'India',:);  
covid19_TN=covid19_data8_IN(covid19_data8_IN.Province_State == 'Tamil  
Nadu',:);  
plot(covid19_TN.Last_Update,covid19_TN.max_Deaths);ylabel('Number of  
Deaths');title('TAMIL NADU');
```



From the Curve, it is clear that Covid19 Cases are not into further Aggregation in Tamil Nadu.