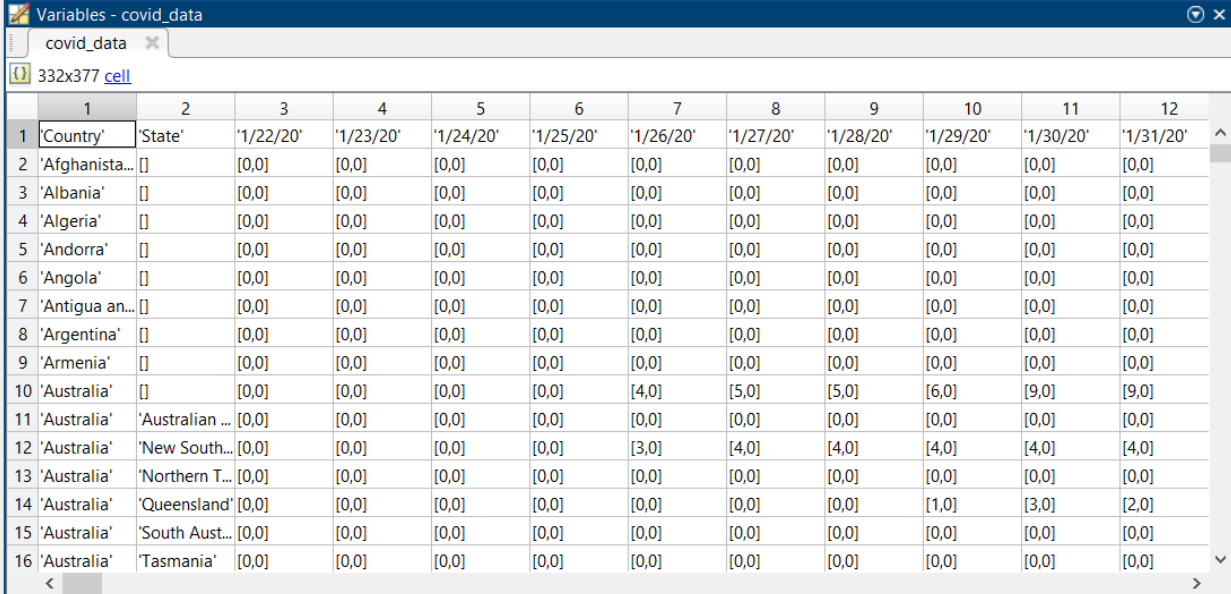


# Covid-19 Data Visualization using MATLAB

- The Goal of the project is to process and visualize covid-19 pandemic data obtained from Coronavirus Resource Center at the John Hopkins University.
- The Dataset is divided as Country-State-date (ranging from 22/01/2020 to Most recent updated dataset date).
- Each date cell for a given country and date contains a 2-element vector of doubles: the first element is a cumulative case count, while the second is the cumulative number of deaths.



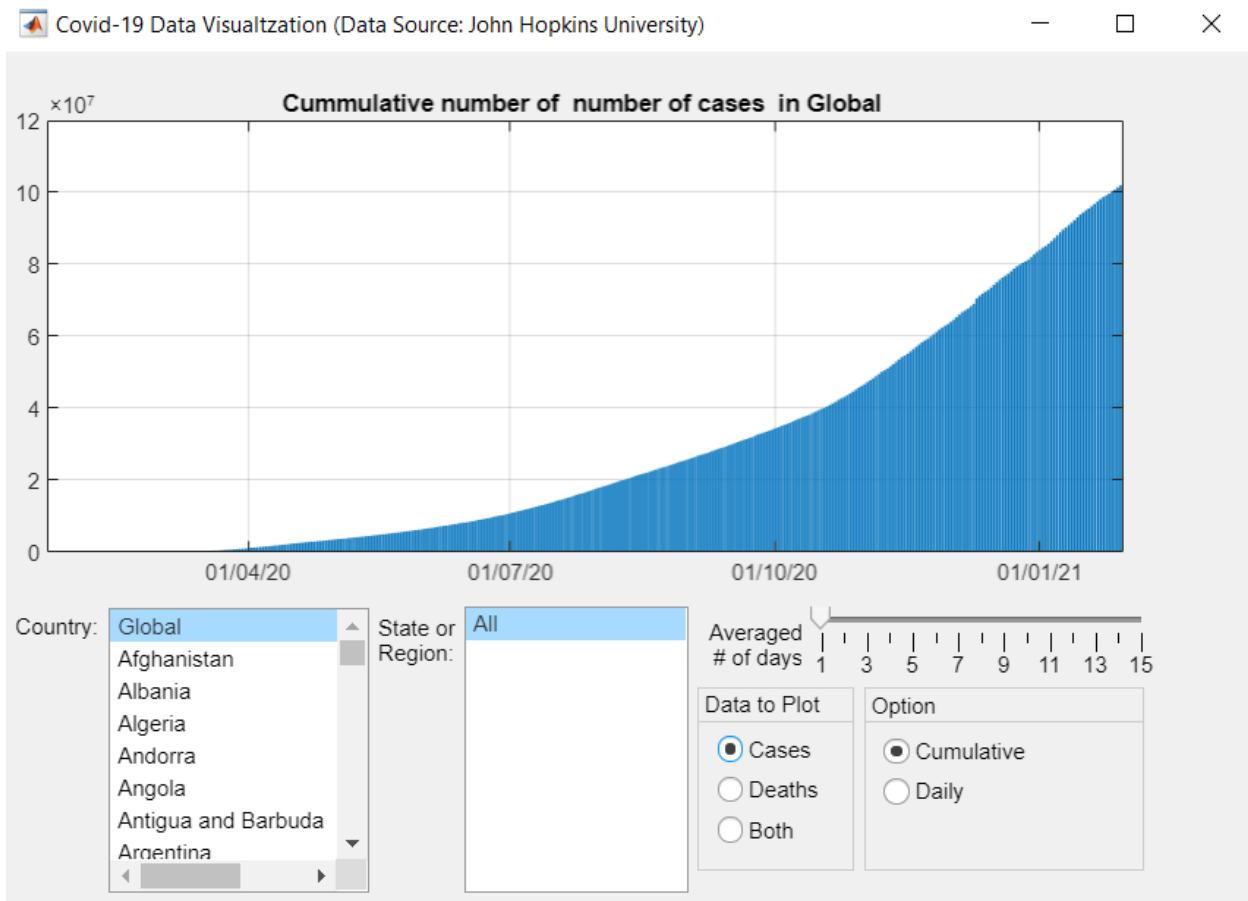
	1	2	3	4	5	6	7	8	9	10	11	12
1	'Country'	'State'	'1/22/20'	'1/23/20'	'1/24/20'	'1/25/20'	'1/26/20'	'1/27/20'	'1/28/20'	'1/29/20'	'1/30/20'	'1/31/20'
2	'Afghanista...	[]	[0,0]	[0,0]	[0,0]	[0,0]	[0,0]	[0,0]	[0,0]	[0,0]	[0,0]	[0,0]
3	'Albania'	[]	[0,0]	[0,0]	[0,0]	[0,0]	[0,0]	[0,0]	[0,0]	[0,0]	[0,0]	[0,0]
4	'Algeria'	[]	[0,0]	[0,0]	[0,0]	[0,0]	[0,0]	[0,0]	[0,0]	[0,0]	[0,0]	[0,0]
5	'Andorra'	[]	[0,0]	[0,0]	[0,0]	[0,0]	[0,0]	[0,0]	[0,0]	[0,0]	[0,0]	[0,0]
6	'Angola'	[]	[0,0]	[0,0]	[0,0]	[0,0]	[0,0]	[0,0]	[0,0]	[0,0]	[0,0]	[0,0]
7	'Antigua an...	[]	[0,0]	[0,0]	[0,0]	[0,0]	[0,0]	[0,0]	[0,0]	[0,0]	[0,0]	[0,0]
8	'Argentina'	[]	[0,0]	[0,0]	[0,0]	[0,0]	[0,0]	[0,0]	[0,0]	[0,0]	[0,0]	[0,0]
9	'Armenia'	[]	[0,0]	[0,0]	[0,0]	[0,0]	[0,0]	[0,0]	[0,0]	[0,0]	[0,0]	[0,0]
10	'Australia'	[]	[0,0]	[0,0]	[0,0]	[0,0]	[4,0]	[5,0]	[5,0]	[6,0]	[9,0]	[9,0]
11	'Australia'	'Australian ...'	[0,0]	[0,0]	[0,0]	[0,0]	[0,0]	[0,0]	[0,0]	[0,0]	[0,0]	[0,0]
12	'Australia'	'New South...	[0,0]	[0,0]	[0,0]	[0,0]	[3,0]	[4,0]	[4,0]	[4,0]	[4,0]	[4,0]
13	'Australia'	'Northern T...	[0,0]	[0,0]	[0,0]	[0,0]	[0,0]	[0,0]	[0,0]	[0,0]	[0,0]	[0,0]
14	'Australia'	'Queensland'	[0,0]	[0,0]	[0,0]	[0,0]	[0,0]	[0,0]	[0,0]	[1,0]	[3,0]	[2,0]
15	'Australia'	'South Aust...	[0,0]	[0,0]	[0,0]	[0,0]	[0,0]	[0,0]	[0,0]	[0,0]	[0,0]	[0,0]
16	'Australia'	'Tasmania'	[0,0]	[0,0]	[0,0]	[0,0]	[0,0]	[0,0]	[0,0]	[0,0]	[0,0]	[0,0]

- The initial stage is to design the screen layout which contains following elements:
  - A single area to plot the data
  - A list box showing all available countries
  - Another list showing all states of selected country (first option is All)
  - A widget to select the number of days used to calculate moving average
  - A widget to select what to plot: cases, deaths, or both
  - A widget to select whether to plot cumulative or daily data

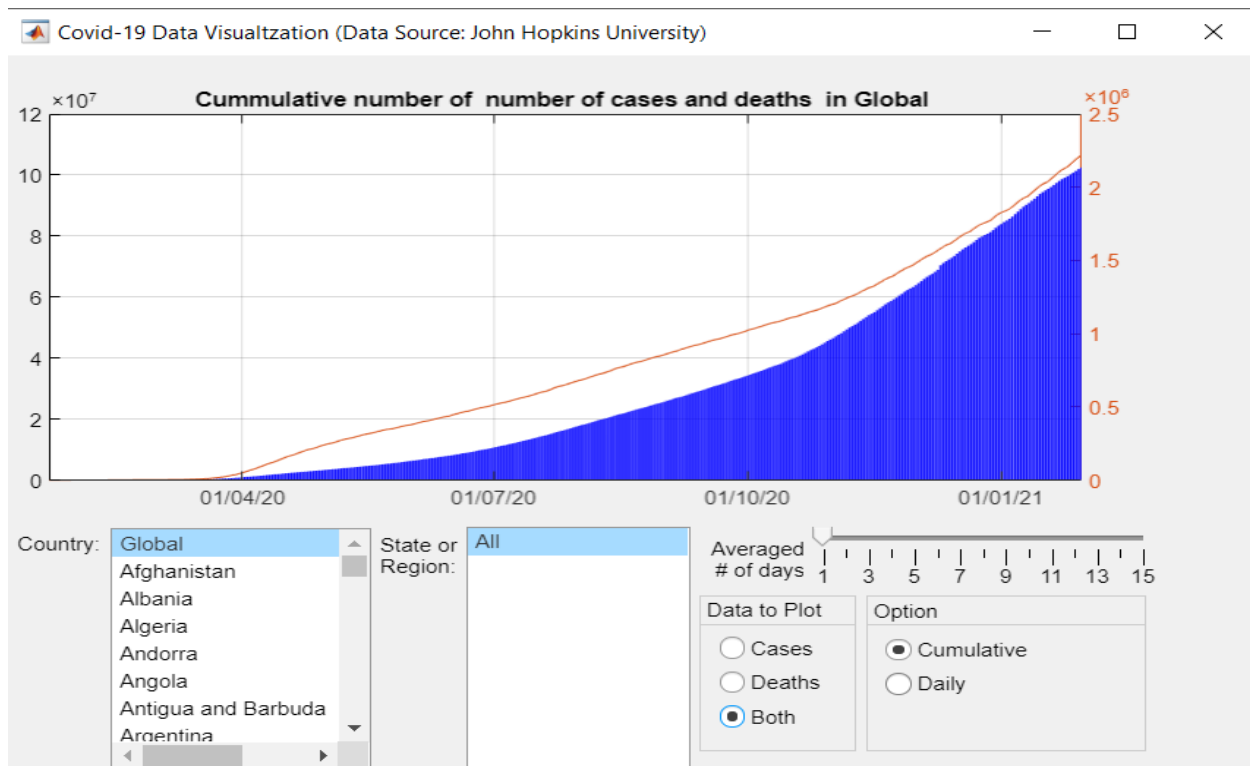
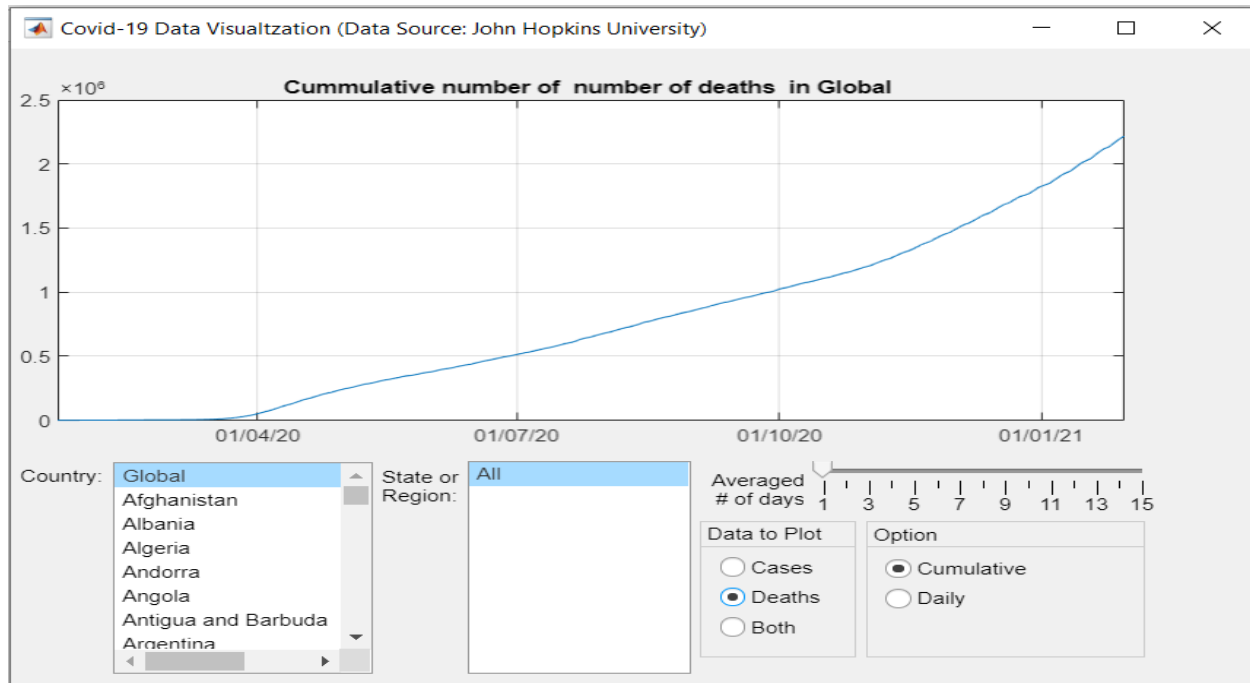
- The mat file which contains the dataset is converted into the set of objects: one object per country and state. So there would be a 3-level hierarchy:
  - Global object that stores data for entire world
  - A vector of country objects
  - Object of countries that have state in it

**Below are some snapshots of the visualizer:**

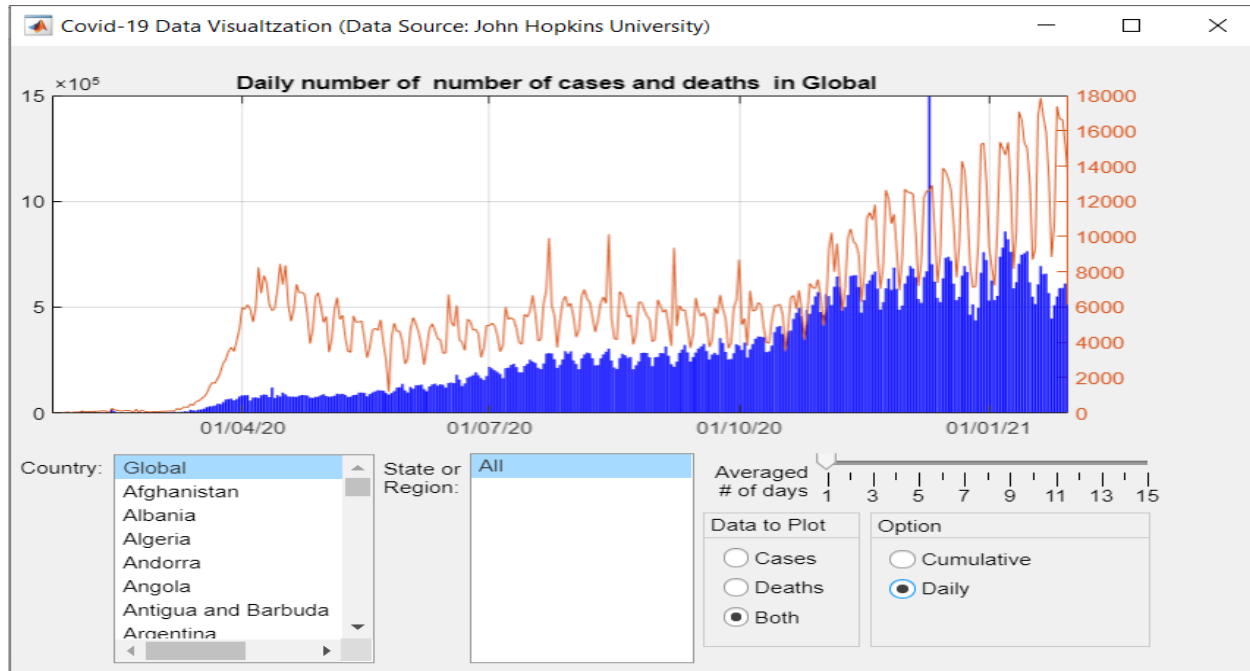
1. Initially it will show cumulative number of cases Globally with moving average 1



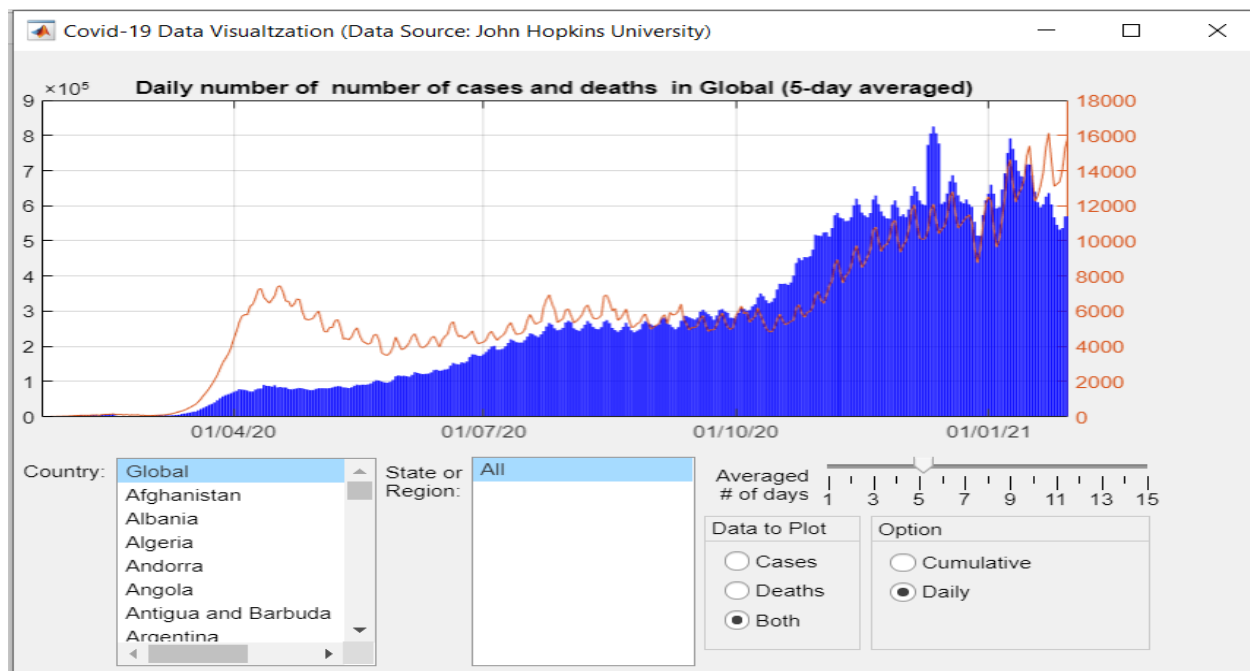
2. Now if we select Deaths as a data to plot, the x scale will remain same, however y scale will change according to deaths. Also if we select both, then there will be two y scales: one for cases other for deaths



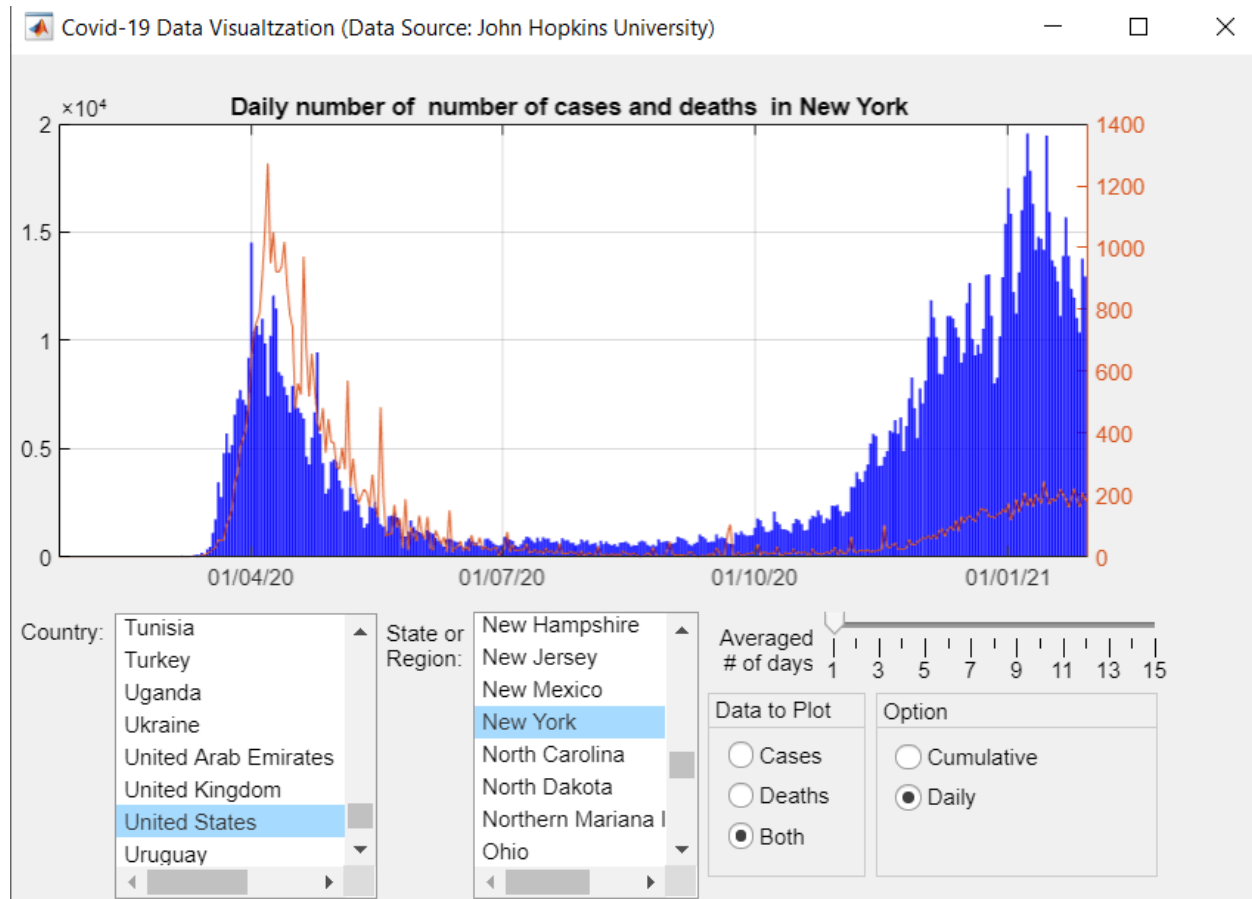
3. If we select the Daily option to plot for data, then appropriate function will be called and daily number of cases and deaths will be calculated and plotted with appropriate scales.



4. If we slide the pointer to anywhere between 1 and 15, then the moving average will be calculated using previous n and after n days of data.



5. If any country has data divided into states in the dataset, then selecting that country will open all the states associated with that country and choosing any state will plot the data of that state only. All the other options will function as it is.



So here we have selected the United States as a country. Selecting it will display all states associated with the selected country. So now we have selected New York for visualizing the covid data associated with New York.

The title above the plotted data changes dynamically as we select and change various options for plotting the data. So user can get information about overall plotting of data.

**Steps to run the project:**

- Install MATLAB or open MATLAB online and upload the files to MATLAB online.
- Run Covid\_Data\_Visualization.mlapp.
- It will open MATLAB's App Designer.
- Click Run from the menu bar and a window will open.