

**Due Date: February 10th, 2022**

*Problems due: 2*

Download data set from: <https://data.incovid19.org/csv/latest/states.csv>

1. Go to <https://data.incovid19.org> and write out a one paragraph description of what the data set contains.
2. Load `state.csv` in R into a dataframe called `statedf`.
  - (a) Pick a state of India which has the same starting letter as the starting letters in your first, middle or last name. For E.g.: Siva Athreya could pick Arunachal Pradesh<sup>1</sup>.
  - (b) Subset the dataframe `statedf` to have only data from the state that you picked in the previous step and call the resulting dataframe as `mystatedf`
  - (c) Using `mycodedf` compute the daily active cases for the state. Then plot a line chart using `geom_line` for the same from the date you started classes in B.Math (hons.), `viridis` colored by date. Provide: Title as "Active cases for State- NAME"; Xlabel - dates, Ylabel - Cases, X-ticks to be dates.
  - (d) Using `mycodedf` compute the total `Deceased` figures for each month since March 2020 till date. Then plot a bar chart using `geom_bar` of the monthly Deceased totals, `viridis` colored by month. Provide: Title as "Monthly Deceased Totals for State- NAME"; Xlabel - Months, Ylabel - Deceased Total, X-ticks to be names of months.
  - (e) Using `statedf` compute the total `Confirmed` cases and total `Deceased` for each state since March 2020 till date. Then plot a scatter using `geom_point` of the total confirmed cases of the states versus total deceased figures; `viridis` colored by state. Provide: Title as "Scatter Plot of Confirmed Versus Deceased"; Xlabel - Deceased Figures, Ylabel - Confirmed Cases. *Can you label the dots with the State names ?*
3. Using the appropriate inbuilt function `r..` and `d..` do the following:
  - (a) Simulate 1000 samples from Negative Binomial(10, 0.4) and plot the histogram of the data set generated, along with a linechart of the true Probabilities.
  - (b) Simulate 1000 samples from Poisson (3) and plot the histogram of the data set generated, along with a linechart of the true Probabilities.

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<sup>1</sup>If there is no such state then use the second letter and proceed till you are able to find a state