Information Visualization - Final

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This exam is **open-book exam**. You can search online, or utilize the materials on coding sessions and assignments. But, **discussing with friends or utilizing AI for coding assistance (e.g. ChatGPT, CoPilot) is not allowed.**

You are allowed to submit your answers and leave early, but please note that **any updates made to your submission after leaving the room will not be accepted or reflected in your grade**. Additionally, **late submissions will not be accepted** under any circumstances.

After you unzip FinalExam.zip you will see 2 directories: **js** and data. You will see index.js, **main.js, lineChart.js and linebrush.js**, in the js directory. You should write all your codes at **the designated part in main.js, lineChart.js and linebrush.js annotated as [your code Here] (You should not edit other parts!! -4pts deduction if you edited other parts)**.

0   Setting Node.JS (0pts)

To run the server and start solving, follow these instructions.

1. Turn on the terminal and run **npm install** command.

2. Run **npm start** command on the same directory. It will run the local server. If you see the message *Local server with port 3000 opened!*, you successfully set up the environment. Now, you can check your implementation at http://localhost:3000.
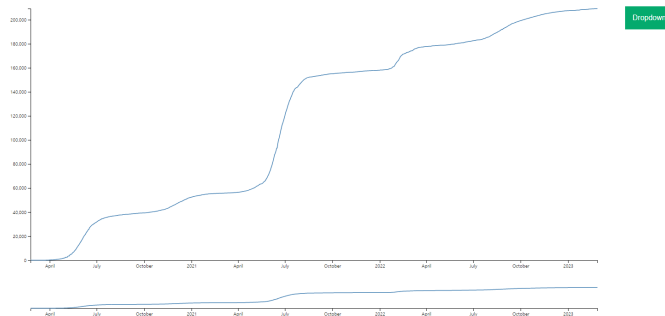

Figure 1: Initial Page

After you run the server, you will be able to see 2 line charts that show the increment of the total cases(total confirmed cases of COVID-19), and a button for a dropdown like Figure 1.

1 Implement Dropdown(10pts)

In this section, you will implement redrawing charts using dropdown. At the initial state, you can click the dropdown button and toggle the dropdown. However, the list is empty and it only shows the search input. You have to implement the interaction by following the instructions below:

- You have to generate the list of countries in the dataset and put it in the dropdown. (4pts)

- When you click the country in the dropdown list, the system should delete the current line charts and redraw the both line charts with the data of selected country. (3pts each)
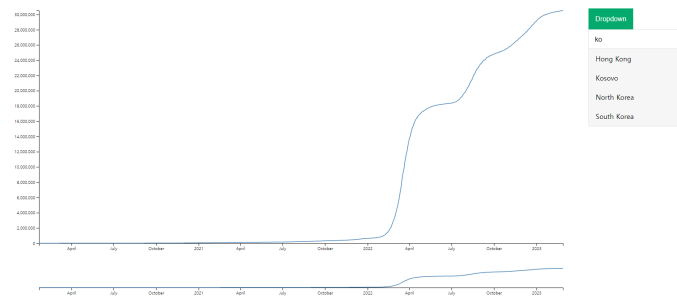

Figure 2: Redrawing by selection in the dropdown

After you implement this, you will be able to search the desired country, and redraw the charts by clicking the country like Figure 2 and the example video.

2 Implement Focus+Context line chart with Brush interaction (30pts)

In this section, you will implement a Focus+Context visualization with 2 line charts. This system consists of a Focus view which shows the current part of interest, and a Context view which shows the overview of the entire chart. In this system, the upper, larger line chart will be the Focus view, and the lower, smaller line chart will be the Context view. You have to implement this by following the instructions below.

- You have to implement a brush interaction in the Context line chart. (4pts)

- As you brush in the Context line chart, the chart should calculate the time where the left-end of the brushed area points, and the time where the right-end of the brushed area points. (4pts)

- After calculating the times, the function should send them to the method in the Focus line chart class. (2pts)

- With those times, the method in the Focus line chart must redraw(or zoom) the line chart. (6pts)

- The x-axis must change following the zoom. The minimum and the maximum values of the x-axis should be the times calculated above. (6pts)

- The zooming must happen only in the x-axis. The y-axis must stay the same. (3pts)

- When you clear the brush, the Focus chart should go back to default state, showing the overview of the data. (5pts)
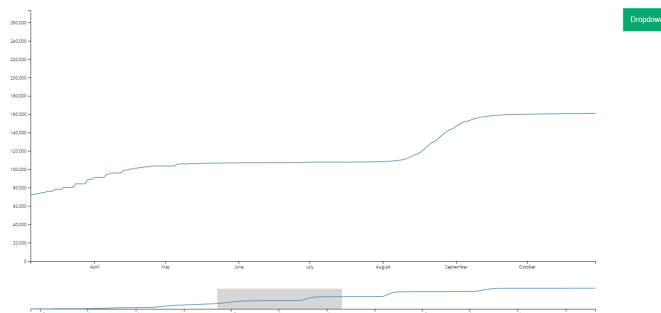

Figure 3: Implementing Focus+Context line chart with brush

After you implement this, you will be able to brush in the Context chart, and see the Focus chart showing the brushed area in detail like Figure 3 and the example video.

3 Submission

After you complete tasks, you should zip all the files into **YourStudentId_YourName.zip**. (e.g. 20251234_JohnDoe, **-2pts deduction if you don't follow this format!**). Your file must look like this:

```
YourStudentId_YourName.zip
├── data
│   └── owid-covid-data.csv
├── js
│   ├── index.js
│   ├── linebrush.js
│   ├── linechart.js
│   └── main.js
├── ans1.png (Not essential)
├── ans2.png (Not essential)
├── example.mp4 (Not essential)
├── init.jpg (Not essential)
├── index.html
├── package.json
└── Instruction.pdf (Not essential)
```

You should upload this file via Blackboard.