

1. (30pts) List 3 limitations of human visual system. For each of them, give an example and describe its implication for designing a visualization.
2. (25pts) Analyze a visualization. Analyze and evaluate the visualization in Figure 1 by answering the following questions:
- (5pts) What is the goal of the visualization?
 - (5pts) What is its data? types of data?
 - (5pts) How do authors encode data and its attributes?
 - (10pts) Is it a good design? If not, propose a better design

XÁC SUẤT TIẾP XÚC GẦN VỚI NGƯỜI BỆNH

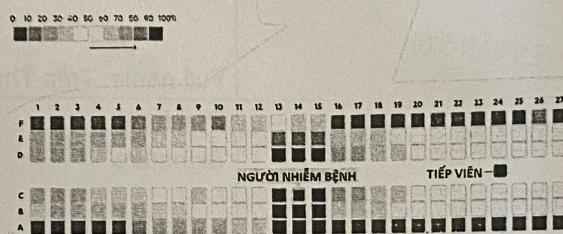


Figure 1

3. (20pts) Redesign. COVID-19 is known to be very infectious in closed area like in an aircraft cabin. The Figure 2 shows a case of COVID-19 spreading in an aircraft. However, the visualization is not compatible with gray-scale printing.

Your task is to

- Redesign the visualization in such a way that could show different groups in a gray-scale printing.
- Justify your design: the reason for your selection of marks, channels and others

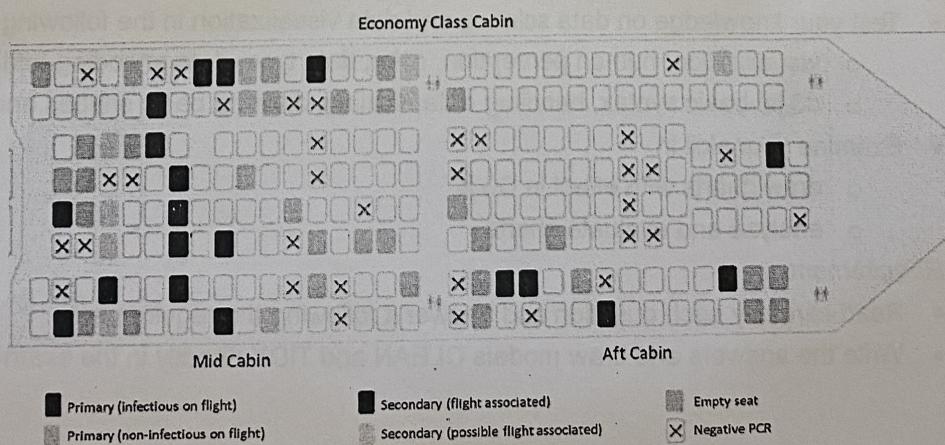


Figure 2 - COVID-19 patients in an aircraft cabin

VIET

4. (25pts) Create an HTML web page with the title “Midterm”.

- a. Get data from https://raw.githubusercontent.com/CSSEGISandData/COVID-19/master/csse_covid_19_data/csse_covid_19_time_series/time_series_covid19_confirmed_global.csv

(in your code, you can refer to this source as “covid_global.csv”)

In the dataset,

- “Province/State” and “Country/Region” are used as the key for each row.
- The date is in US-format

Figure 3 is a sample from the dataset.

A	B	C	D	E	F	G	H	I	J
Province/State	Country/Region	Lat	Long	1/22/20	1/23/20	1/24/20	1/25/20	1/26/20	1/27/20
Northwest Territories	Canada	64.8255	-124.846	0	0	0	0	0	0
Nova Scotia	Canada	44.682	-63.7443	0	0	0	0	0	0
Nunavut	Canada	70.2998	-83.1076	0	0	0	0	0	0
Ontario	Canada	51.2538	-85.3232	0	0	0	0	1	1
Prince Edward Island	Canada	46.5107	-63.4168	0	0	0	0	0	0
Quebec	Canada	52.9399	-73.5491	0	0	0	0	0	0
Repatriated Travellers	Canada			0	0	0	0	0	0
Saskatchewan	Canada	52.9399	-106.451	0	0	0	0	0	0
Yukon	Canada	64.2823	-135	0	0	0	0	0	0
	Central African Republic	6.6111	20.9394	0	0	0	0	0	0
	Chad	15.4542	18.7322	0	0	0	0	0	0
	Chile	-35.675	-71.543	0	0	0	0	0	0
Anhui	China	31.8257	117.2264	1	9	15	39	60	70
Beijing	China	40.1824	116.4142	14	22	36	41	68	80
Chongqing	China	30.0572	107.874	6	9	27	57	75	110
Fujian	China	26.0789	117.9874	1	5	10	18	35	59
Gansu	China	35.7518	104.2861	0	2	2	4	7	14

Figure 3 - A sample from the dataset

- b. Write code to draw a horizontal bar chart to show COVID confirmed cases over the world on “1/25/2020”. The chart must

- R1. (5pts) have a fixed size (use scale to convert data)
- R2. (5pts) have axis with a title and ticks
- R3. (5pts) use Province/State and Country/Region as key/label for a row
- R4. (5pts) show only non-zero rows (Use filter function of arrays in javascript)
- R5. (5pts) show value in the bar

Hint:

- Use rowConverter
- Use parseInt, parseFloat to convert strings to numbers
- Filter function of arrays in javascript.

```
newDataSet = dataset.filter(d => d["1/25/2020"] > 0);
```

-- The end --