Data visualization project

[ CST2106: Data Visualization]

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* **What are the questions that you are trying to answer through visualization?**
* We have had the covid for about a year now, which has had a considerable financial effect across the whole of Canada. Many communities in Canada have been impacted in various ways by the Covid-19. It was expected to trip up the economy after the virus shuttered businesses and led to many layoffs.
* The economic restrictions and social distancing measures during the covid-19 pandemic have caused major disruptions to Canadian businesses and labour market. It also has impacted working hours of Canadians.

Therefore, below are questions we are trying to answer through our visualization:

1. How has the COVID-19 impacted **Canadian economy**?
2. What is the impact of COVID-19 On **Labour Market**?
3. Is there a change in **working hours of Canadians** due to COVID-19?
4. What is the state of **different industries by province wise** after COVID-19?
5. Were all **industries affected equally**? (If not, which was affected compared to others?)
6. Which **industries have managed to recover** from the impact of COVID-19?
7. How has it affected **Canadians in different industries in terms of layoffs**?

* **Background Info**
* Coronavirus disease (Covid-19) is an infectious disease caused by a newly discovered coronavirus. On 11th march, Canada records more than 100 cases; On 16th march, Canada announces it is closing borders to non-Canadians. On 17th march, Ontario and Alberta declares state of emergency.
* Since the end of 2019, the world is currently experiencing a global pandemic of coronavirus disease. Canada, just like the whole world, has been affected by it. Aside from the apparent fears of becoming sick, the pandemic's economic impacts are an added stress for many Canadians.
* Twenty-eight percent of Canadians in April reported they had been laid off due to the pandemic in April-2019, and the remaining percentage has been affected one way or another.
* Still, despite the devastating impacts of the covid, we are not so sure if there is a common trend in different industries economically speaking; some industries are soaring while others are plugging because of the covid. This pandemic has pushed us to look deeper into the matter.
* **The student’s difficulties encountered and how they were resolved?**
* The hardest part was finding first a reliable dataset, then a helpful dataset; most of the datasets were not helpful for the story we were trying to tell.
* The second part was cleaning the data by removing unnecessary information, such as columns that were not really needed in our story.
* Merging two datasets was the most challenging part of our project because our datasets had not exact common column. We did extra work by summing up data of different industries to make common values of a shared column between 2 datasets.
* Then in Tableau Desktop, we pivoted the dataset to make much more sense, which helped us manage and combine our visualizations.

**Difficulties faced while cleaning data in Tableau prep software:**

* “BuisnessStatusClean” and “LayoffsDataClean” are raw file, which we’ve cleaned using tableau prep software.
* First, we have loaded the datasets in tableau prep software.
* Then for both datasets in the cleaning step, we have removed unnecessary columns. After that we grouped the values, which are lies in the Layoffs coloumn.
* In 3rd stage, we pivoted both datasets, so that it could convert into tidy data which makes more sense.
* In the final stage, we did union on both datasets, because both datasets contain common columns. And, then we added the final output step to generate .csv file to visualize in tableau desktop software.
* **Analysis**

Taking January 2019 as a starting point, and December 2020 as an ending point

1. **Impact of COVID-19 on Canada’s GDP (Gross Domestic Product)**

* Canada’s GDP peaked in the month of February-2020 with growth of 2.4% compared to starting point.
* However, start of pandemic and subsequent nation-wide lockdown resulted in decline of GDP by -16.8% compared to January-2019.
* At the end of December 2020, GDP still has not recovered to the pre-covid levels.

1. **Impact of COVID-19 on Labour Market**

* Employment number has shown as rising trend of 2% in February-2020 compared to starting point.
* However, start of pandemic and subsequent nation-wide lockdown resulted in unemployment, bringing the employment down by -13.6% compared to January-2019.
* Although at the end of December 2020, employment number has almost reached the January-2019 level, it is still very much unstable.

1. **Impact of COVID-19 on working hours of Canadians**

* A growing trend was observed until February 2020, wherein the hours peaked at 2.1% compared to starting point.
* start of pandemic and subsequent nation-wide lockdown reduced hours worked by -26.6%
* Still Although at the end of December 2020, Hours worked has not recovered to the pre-covid levels.

1. **Industry and Province wise impact of COVD-19**

* Transportation, Hotel/Food services and Entertainment are worst affected by Covid-19.
* Agriculture, Finance and Insurance did well in terms of growth. They were not affected at all by COVID-19.
* Wholesale trade, Retail trade and Real estate have been impacted during early days of lockdown by COVID-19. However, they have managed to recover from it.
* **Conclusion**
* The impact of Covid 19 has clearly been visible on the Canadian economy, Labour market and different industries established across whole Canada. At the end of 2020, Canada's economy and working hours of Canadians have not been recovered to the pre-covid levels. However, the Employment level has been able to reach pre-covid levels.
* **Dataset links:**
* <https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1410028901>
* <https://www150.statcan.gc.ca/t1/tbl1/en/cv.action?pid=3310030901>
* <https://www150.statcan.gc.ca/t1/tbl1/en/cv.action?pid=3310027901>
* <https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=3610043401>
* <https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1410001701>
* <https://ourworldindata.org/coronavirus-data>