**Problem Description and Research Question**

As we move into the 21st century, educational qualities all around the world had experienced drastic changes as time passed. Under such circumstances, countless goals proposed by officials of different regions and countries were launched. An example of these goals would be Sustainable Development Goal Target 4, which is, Quality Education.

However, as we mark the end of a decade with the Year 2020, an unforeseen pandemic named COVID-19 disrupted the lives of millions of people around the world. COVID-19 had influenced our lives in a plethora of ways. It not only posed severe health threats for humans in general, political and socio-economic impacts were also observed consistently in the months after the original discovery of COVID-19. One of the main socio-economic impacts that the COVID-19 pandemic posed on our society is the educational crisis.

Our investigation aims to identify and examine the impacts that COVID-19 had brought to the educational sector of countries. To be more specific, we will focus on the relationships between the COVID-19 pandemic and school closures all around the world.

Our main motivation for investigating this topic is that as a group of international students, COVID-19 thoroughly change many aspects of our life, and one of the most significant changes to us is school closures. In the last year, we mostly took classes in a brand new online way, but later some of our schools resumed in-person education. Therefore, we are curious about the correlation between COVID-19 and school closures, and the impacts of these changes on our mental health and education quality.

We hope that this project will help us gain some insights into the impacts on the educational scheme brought by this catastrophic event. Thereby, we may be able to predict how future pandemics affect our education and how to mitigate those potential negative influences.

**Dataset Description**

We have identified two main datasets that will be relevant for our project’s implementation. These are:

1. Global School Closures for COVID-19 – Obtained from Kaggle, compiled by Saleh Ahmed Rony, sourced from UNESCO
2. COVID-19 Data Repository by the Center for Systems Science and Engineering (CSSE) at Johns Hopkins University – Obtained from GitHub, compiled by JHU, sourced from WHO, ECDC, DXY, US CDC, etc.

Both datasets will be stored in a Comma Separated Value file, which will allow us to read from them easily through Python’s csv library.

Furthermore, both datasets are very credible as they are sourced from multiple sites, including but not limited to WHO, ECDC, and US CDC. Furthermore, these datasets are also licensed under the Creative Commons Attribution 4.0 International (CC BY 4.0), which allows us to utilize these data for our own needs.

The datasets that we have downloaded and utilized in this project were chosen because they were compiled in a way that allows easy access and manipulation. By using datasets that are already organized could improve the efficiency and robustness of our program.

**Computational Plan**

Our project will be separated into 3 parts: Loading data, Graphical User Interface (GUI) Implementation, Machine Learning Implementation.

1. Loading data

To take care of the datasets that we have downloaded and utilize them in our program, we will first utilize the CSV Python Library to create a CSV Reader object that can be used to extract information from the files.

Then, we will convert relevant data that were included in the datasets into Classes that we will implement in Python. By doing so, we would be able to retrieve and append information quickly to our existing data frames in Python.

1. GUI Implementation

Then, we have planned to utilize pygame, python qt, or tkinter to generate an interactive user interface for our application to run on.

This interface will consist of the following functions:

* Select Mode (Table data, graphical display, forecasting graph)
* Filtering data (Being able to select only data that we are interested in)
* Search (Being able to quickly navigate to a specific data entry)

By the implementation of this GUI, the user of our application would be able to quickly scan the data that we have provided and create their own plots by filtering the data by their will.

1. Machine Learning Implementation

Finally, we would want to utilize the scikit-learn library in Python to generate regression learning mechanisms that could be used to predict future trends of the number of cases of COVID-19 with respect to time.

This will also be built upon the GUI interface, which is one of the options when generating the graph.

If all the implementations mentioned above were completed, we would be able to view, compare, and predict data on the COVID-19 pandemic. Furthermore, we can also answer our research question by quickly filtering countries around the world and attempt to notice a relationship between the number of COVID-19 cases and school closures.

With these, technical implementations, we believe that the impacts brought by the COVID-19 Pandemic would be conspicuous and people could formulate solutions towards the impacts illustrated.

**References**

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