

Project 1

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# Abstract

# 1. Business Understanding

The COVID-19 outbreak began in late 2019 and early 2020. It is a contagious disease caused by a virus SARS-CoV-2. The first case of COVID-19 was documented in Wuhan, China, and due to the virus’ highly contagious nature, the disease spread worldwide in the ensuing months. This spread led to the COVID-19 Pandemic.

Once the United States Federal Government saw how widespread the disease had become, it began taking steps to “flatten the curve,” or lessen the spread. This took the form of “social distancing,” where citizens were expected to limit their exposure to people outside their immediate household, and when that could not be done, stay at least six feet apart. Due to these regulations, places of public gathering, such as churches, gyms, and restaurants, began closing.

In this report, the data on the spread of the virus and its affects will be analyzed in order to determine

# 2. Data Understanding

## 2.1 Data Description

The COVID-19\_cases\_plus\_census dataset contains data from the U.S. Census as well as data relating to the COVID outbreak, such as confirmed cases and deaths. The dataset contains 259 features and 3142 attributes. A truncated description of the dataset is provided in Table 1.

Table 1 The Description of the Data

|  |  |
| --- | --- |
| $ county\_fips\_code | Factor w/ 3142 levels "01001","01003",.. |
| $ county\_name | Factor w/ 1878 levels "Abbeville County",.. |
| $ state | Factor w/ 51 levels "AK","AL","AR",.. |
| $ state\_fips\_code | Factor w/ 51 levels "01","02","04",.. |
| $ date | Date, format |
| $ confirmed\_cases | num |
| $ deaths | num |
| $ geo\_id | Factor w/ 3142 levels "01001","01003",.. |
| $ nonfamily\_households | num |
| $ family\_households | num |
| $ median\_year\_structure\_built | num |
| $ rent\_burden\_not\_computed | num |
| $ rent\_over\_50\_percent | num |
| $ rent\_40\_to\_50\_percent | num |
| $ rent\_35\_to\_40\_percent | num |
| $ rent\_30\_to\_35\_percent | num |
| $ rent\_25\_to\_30\_percent | num |
| $ rent\_20\_to\_25\_percent | num |
| $ rent\_15\_to\_20\_percent | num |
| $ rent\_10\_to\_15\_percent | num |
| $ rent\_under\_10\_percent | num |
| $ total\_pop | num |
| $ male\_pop | num |
| $ female\_pop | num |
| $ median\_age | num |
| $ white\_pop | num |
| $ black\_pop | num |
| $ asian\_pop | num |
| $ hispanic\_pop | num |
| $ amerindian\_pop | num |
| $ other\_race\_pop | num |
| $ two\_or\_more\_races\_pop | num |

Due to the large size of the dataset, this report will only focus on a few important features, rather than taking a broad look at many features. The focus of this report will be to visualize the correlation between confirmed cases, deaths, and population by state, sex, and race. Table 2 shows a description of the updated dataset with only the features that will be analyzed in more detail.

Table 2 Description of Smaller Dataset

|  |  |
| --- | --- |
| $ state | Factor w/ 51 levels "AK","AL","AR",.. |
| $ confirmed\_cases | num |
| $ deaths | num |
| $ total\_pop | num |
| $ male\_pop | num |
| $ female\_pop | num |
| $ white\_pop | num |
| $ black\_pop | num |
| $ asian\_pop | num |
| $ hispanic\_pop | num |
| $ amerindian\_pop | num |

## 2.2 Data Quality

To continue the preprocessing of the data, it is necessary to verify the quality of the data. Duplicates and missing data must be accounted for in order to see quality results once the analysis begins.

The small dataset was verified to find any missing or duplicated values, and there were none of either. The data is clean and ready to be worked with.

# Data Preparation

# Exceptional Work