COVID-19 DataFest

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Topic

We will investigate bridge traffic statistics from the Niagara Falls Bridge Commission and determine whether and how the COVID-19 pandemic has affected activity at the Lewiston-Queenston, Rainbow, and Whirlpool bridges. The Niagara Falls Bridges are the second-busiest port of entry between US and Canada (behind Kennedy International); thus, these traffic statistics offer a unique opportunity to examine how port crossing has been affected by the COVID-19 pandemic.

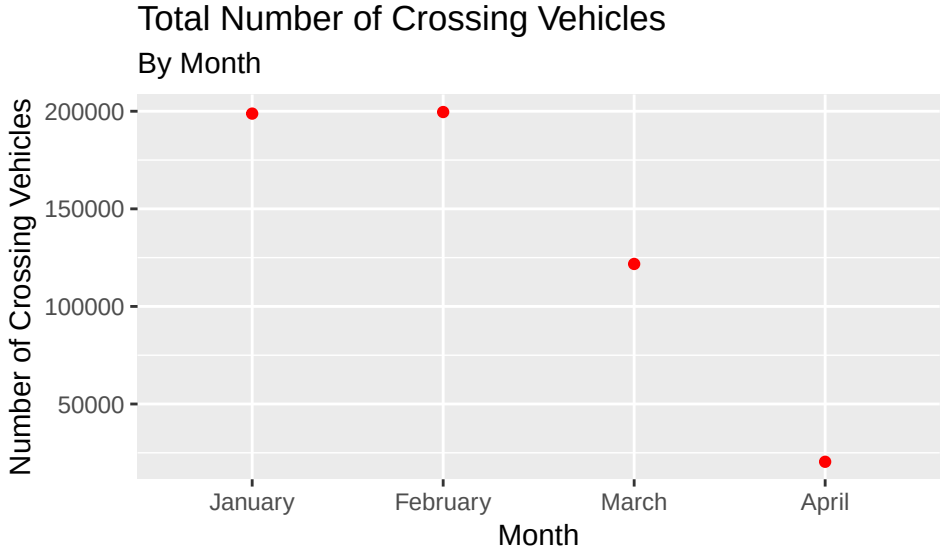
Exploratory Data Analysis

We will begin by examining the aggregate data, which combines the traffic statistics from all three bridges – Lewiston-Queenston, Rainbow, and Whirlpool.

```
## # A tibble: 4 x 2
##   Month     total
##   <fct>     <dbl>
## 1 April     20409
## 2 March    121761
## 3 January  198787
## 4 February 199594
```

As we can see from the table above, bridge traffic was similar in January and February, with about 200,000 vehicles crossing in each month. However, when comparing February to March, we notice a large discrepancy in the number of vehicles – roughly 80,000 less vehicles! Furthermore, comparing March to April reveals an even greater discrepancy – almost 100,000 less vehicles! In sum, from January 2020 to April 2020, the number of vehicles crossing the Niagara Falls Bridges drastically decreased (approximately -180,000 vehicles).

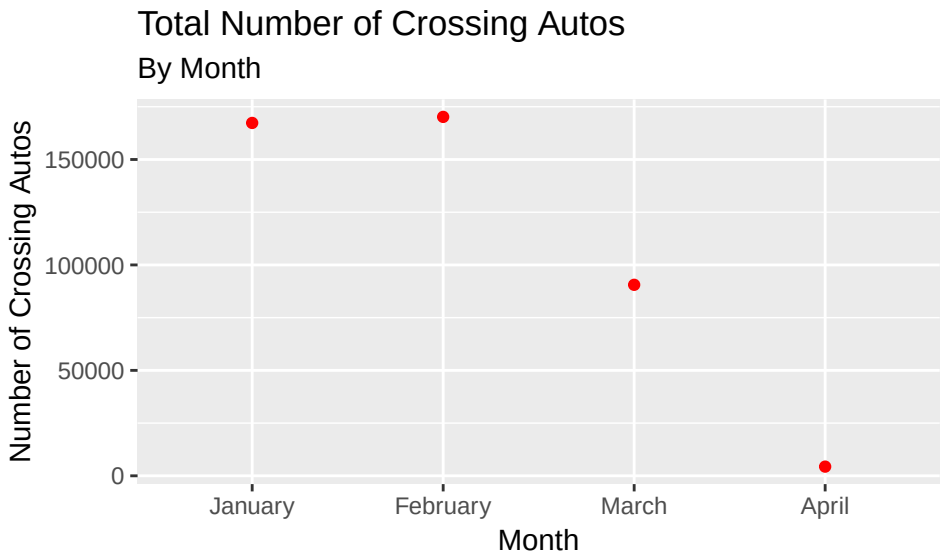
Of course, this aligns with our expectations given the lockdown and social distancing guidelines which have been in place in March and April 2020.



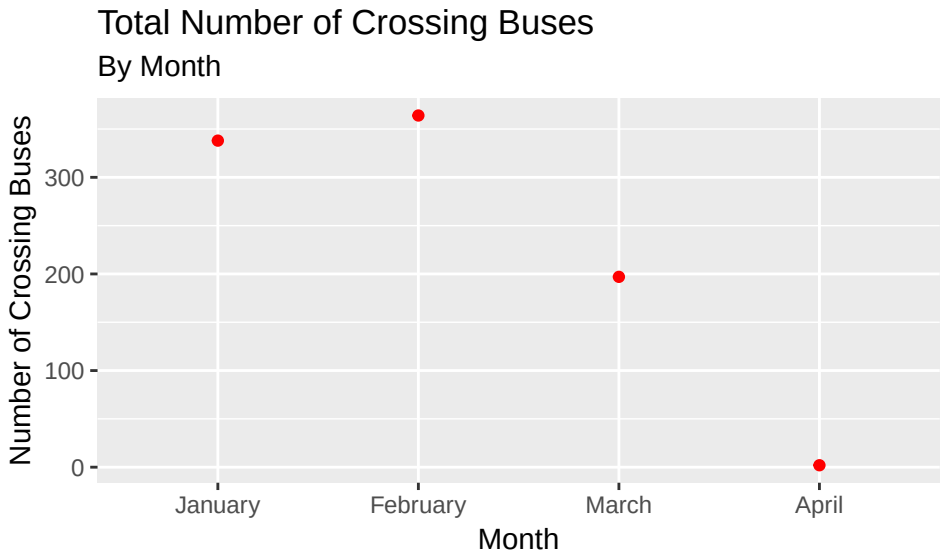
Based on the scatterplot above, there seems to be a nonlinear relationship between month of the year and the number of vehicles crossing the bridges.

Now, we will examine trends in particular types of vehicles:

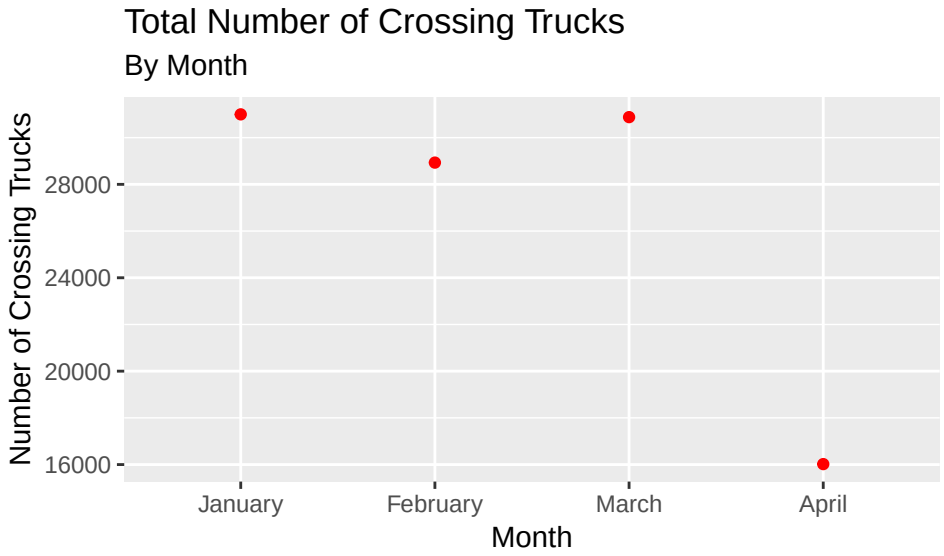
```
## # A tibble: 4 x 2
##   Month    totalA
##   <fct>     <dbl>
## 1 April      4359
## 2 March     90570
## 3 January  167326
## 4 February 170191
```



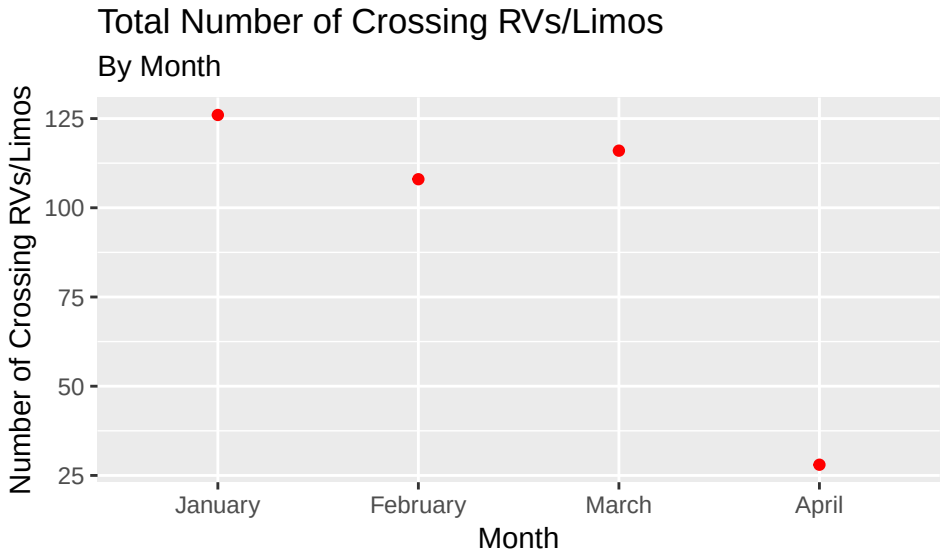

```
## # A tibble: 4 x 2
##   Month    totalB
##   <fct>     <dbl>
## 1 April         2
## 2 March       197
## 3 January     338
## 4 February    364
```



```
## # A tibble: 4 x 2
##   Month    totalT
##   <fct>     <dbl>
## 1 April     16020
## 2 February  28931
## 3 March     30878
## 4 January   30997
```

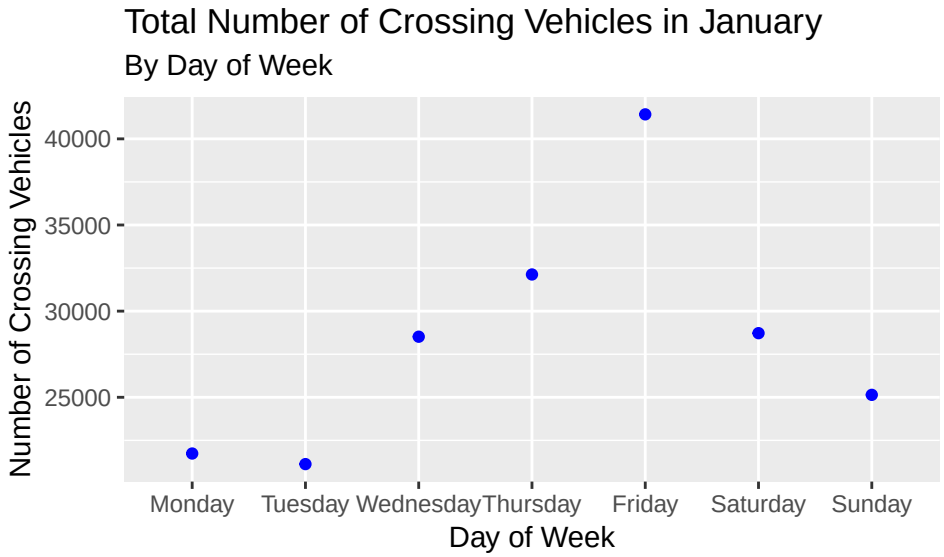



```
## # A tibble: 4 x 2
##   Month    totalRL
##   <fct>      <dbl>
## 1 April         28
## 2 February     108
## 3 March        116
## 4 January      126
```

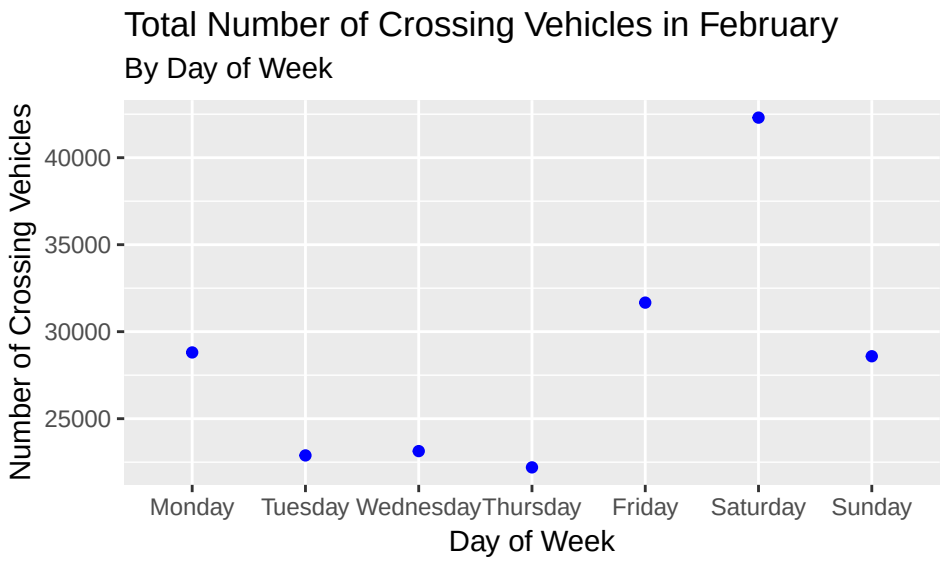



```
## # A tibble: 7 x 2
##   `Day of Week` total
##   <fct>         <dbl>
```

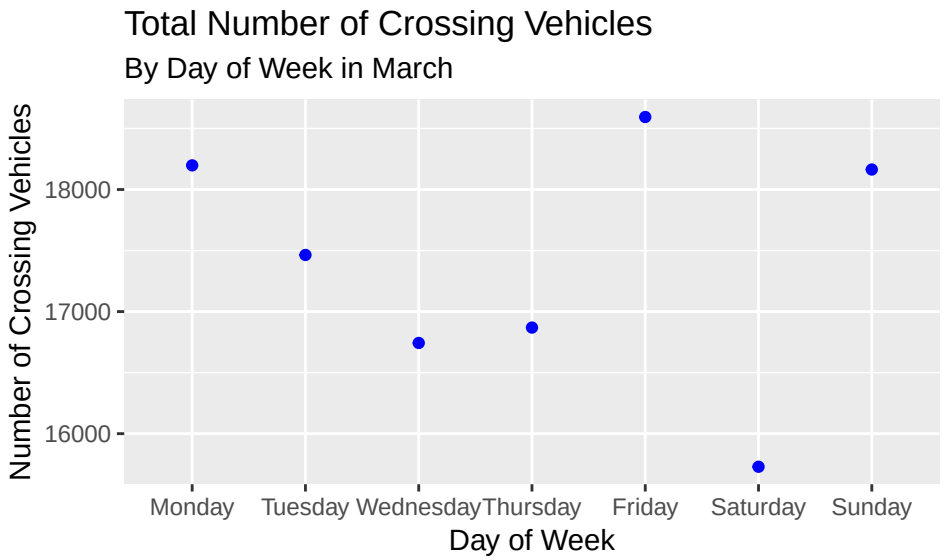
```
## 1 Friday         41421
## 2 Thursday       32128
## 3 Saturday       28722
## 4 Wednesday      28516
## 5 Sunday         25142
## 6 Monday         21736
## 7 Tuesday        21122
```



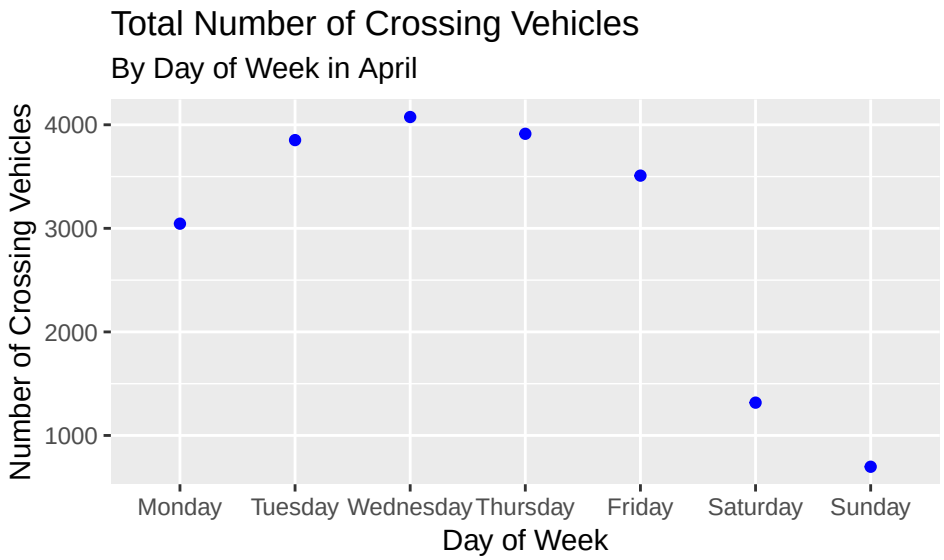

```
## # A tibble: 7 x 2
##   `Day of Week` total
##   <fct>         <dbl>
## 1 Saturday      42302
## 2 Friday        31670
## 3 Monday        28808
## 4 Sunday        28588
## 5 Wednesday     23136
## 6 Tuesday       22888
## 7 Thursday      22202
```



```
## # A tibble: 7 x 2
##   `Day of Week` total
##   <fct>         <dbl>
## 1 Friday        18594
## 2 Monday        18198
## 3 Sunday        18164
## 4 Tuesday       17464
## 5 Thursday      16869
## 6 Wednesday     16743
## 7 Saturday      15729
```




```
## # A tibble: 7 x 2
##   `Day of Week` total
##   <fct>         <dbl>
## 1 Wednesday      4075
## 2 Thursday       3913
## 3 Tuesday        3852
## 4 Friday         3509
## 5 Monday         3045
## 6 Saturday       1317
## 7 Sunday          698
```


Total Number of Crossing Vehicles
By Day of Week in April
Number of Crossing Vehicles
4000
3000
2000
1000
Monday
Tuesday
Wednesday
Thursday
Friday
Saturday
Sunday
Day of Week