1st Year Exam Question 10

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Reading in the CSV file

I will use read.csv() to import the COVID-19 variant data from the California Health and Human Services open data site. The head() will help me visualize the first few lines of the csv file to get an idea of what the data looks like

```
variant_data <- read.csv("covid19_variants.csv")
head(variant_data)
```

```
        date       area area_type variant_name specimens percentage
1 2021-01-01 California     State      Epsilon        29      48.33
2 2021-01-01 California     State        Other        29      48.33
3 2021-01-01 California     State        Gamma         0       0.00
4 2021-01-01 California     State        Delta         0       0.00
5 2021-01-01 California     State         Beta         0       0.00
6 2021-01-01 California     State        Alpha         1       1.67
  specimens_7d_avg percentage_7d_avg
1               NA                NA
2               NA                NA
3               NA                NA
4               NA                NA
5               NA                NA
6               NA                NA
```

Loading in Packages needed for filter data and graphing

In this next chunk, I will load the apprporpiate packages to help with graphing of the data (Lubridate will help with dealing with dates, dplyr will help with filter and isolating which data to graph, ggplot will help with the actual plotting)

```
library(lubridate)
```

```
Warning: package 'lubridate' was built under R version 4.2.2
```

```
Loading required package: timechange
```

```
Warning: package 'timechange' was built under R version 4.2.2
```

```

Attaching package: 'lubridate'
```

```
The following objects are masked from 'package:base':

    date, intersect, setdiff, union
```

```
library(dplyr)
```

```

Attaching package: 'dplyr'
```

```
The following objects are masked from 'package:stats':

    filter, lag
```

```
The following objects are masked from 'package:base':

    intersect, setdiff, setequal, union
```

```
library(ggplot2)
```

```
Warning: package 'ggplot2' was built under R version 4.2.2
```

Converting Dates

Using as.Date to convert the characters representing the date to the class "Date"

```r
variant_data$date <- as.Date(variant_data$date)
```

Filtering out Total and Other

The data in the data table includes the sum of the variants but I do not want that on my plot so I am going to filter those rows out

```r
variants_only <- filter(variant_data, percentage<100)
head(variants_only)
```

```
        date       area area_type variant_name specimens percentage
1 2021-01-01 California     State      Epsilon        29      48.33
2 2021-01-01 California     State        Other        29      48.33
3 2021-01-01 California     State        Gamma         0       0.00
4 2021-01-01 California     State        Delta         0       0.00
5 2021-01-01 California     State         Beta         0       0.00
6 2021-01-01 California     State        Alpha         1       1.67
  specimens_7d_avg percentage_7d_avg
1               NA                NA
2               NA                NA
3               NA                NA
4               NA                NA
5               NA                NA
6               NA                NA
```

The data has unclassified variants as "Other" but I do not want to plot those so I am going to filter those out as well.

```r
variants_name <- filter(variants_only, variant_name != "Other")
head(variants_name)
```

```
        date       area area_type variant_name specimens percentage
1 2021-01-01 California     State      Epsilon        29      48.33
2 2021-01-01 California     State        Gamma         0       0.00
3 2021-01-01 California     State        Delta         0       0.00
4 2021-01-01 California     State         Beta         0       0.00
5 2021-01-01 California     State        Alpha         1       1.67
6 2021-01-01 California     State      Omicron         1       1.67
  specimens_7d_avg percentage_7d_avg
```

```
1                NA                NA
2                NA                NA
3                NA                NA
4                NA                NA
5                NA                NA
6                NA                NA
```

Plotting the Variant Data

Here I will plot the filtered data using ggplot. I will plot the date and percentage for each variant using geom_line() and will color the data by the variant name to be able to distinguish the data for each variant.

```
variant_plot <- ggplot(variants_name)+
  aes(date, percentage, color=variant_name )+
  geom_line()
```

This line of code will edit the x and y labels. Add the title and caption and remove the label for the key

```
variant_plot <- variant_plot+
  labs(x="", y="Percentage of sequenced specimens",
       title="COVID-19 Variants in California",
       caption="Data Source: <https://www.cdph.ca.gov/>",
       color="")
```

This next line of code will change the scale of the x axis and will make it so the x axis ticks are 1 month apart. Additionally, the date_labels= will make it so the format is in Month and Year

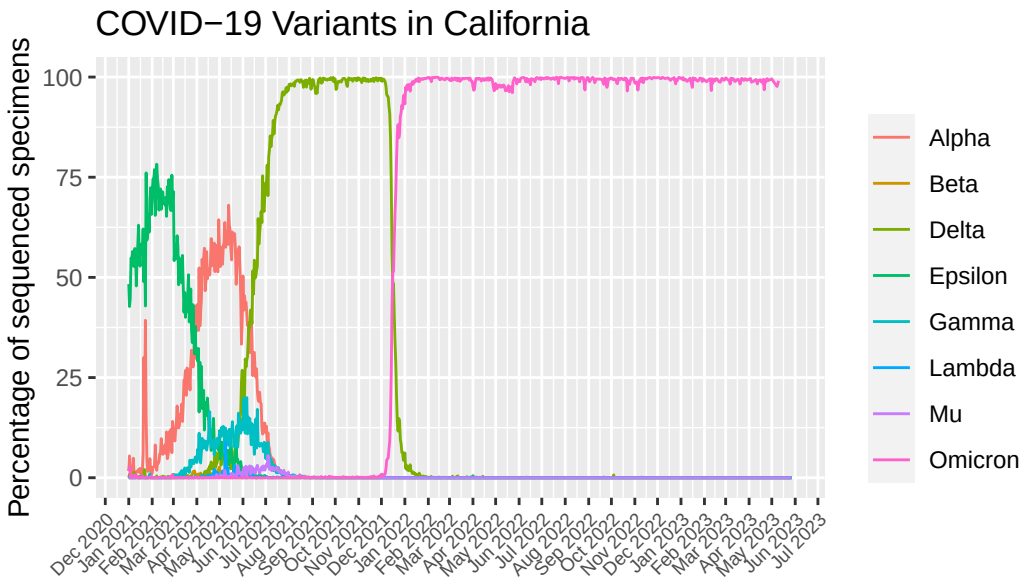
```
variant_plot <- variant_plot+
  scale_x_date(date_breaks = "1 month", date_labels = "%b %Y")
```

This line of code is to help format the axis labels, the angle rotates the text and the hjust will change the horizontal justification so the labels don't overlap the graph

```
variant_plot <- variant_plot+
  theme(axis.text.x = element_text(angle =45, hjust=1, size=7))
```

Now to actually see the plot!!!

```
variant_plot
```



Data Source: <https://www.cdph.ca.gov/>