DATA 607 - EC 1

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Loading the Data

Source: Yahoo Finance BTC-USD.

The data set tracks the market price and volume of Bitcoin in USD. The data used was from January to December of 2022.

```
bitcoins <- read_csv(url("https://raw.githubusercontent.com/ShanaFarber/cuny-sps/master/DATA%20607/Extra

# change the type of 'Date' column to be a date
bitcoins$Date <- as.Date(bitcoins$Date)

knitr::kable(head(bitcoins))
```

Date	Open	High	Low	Close	Adj Close	Volume
2022-01-01	46311.75	47827.31	46288.48	47686.81	47686.81	24582667004
2022-01-02	47680.93	47881.41	46856.94	47345.22	47345.22	27951569547
2022-01-03	47343.54	47510.73	45835.96	46458.12	46458.12	33071628362
2022-01-04	46458.85	47406.55	45752.46	45897.57	45897.57	42494677905
2022-01-05	45899.36	46929.05	42798.22	43569.00	43569.00	36851084859
2022-01-06	43565.51	43748.72	42645.54	43160.93	43160.93	30208048289

Computing the Average to Date and Six Day Rolling Window for Opening and Closing

```
bitcoins_open <- bitcoins %>%
  transmute(date = Date, open = Open) %>%
  mutate(open_ytd_avg = cumsum(open) / seq_along(open),
         open_six_day_window = rollmean(open, 6, fill = NA))

knitr::kable(head(bitcoins_open))
```

date	open	open_ytd_avg	open_six_day_window
2022-01-01	46311.75	46311.75	NA
2022-01-02	47680.93	46996.34	NA
2022-01-03	47343.54	47112.07	46209.99
2022-01-04	46458.85	46948.77	45683.63
2022-01-05	45899.36	46738.89	44663.72

date	open	open_ytd_avg	open_six_day_window
2022-01-06	43565.51	46209.99	43728.91

```
bitcoins_close <- bitcoins %>%
  transmute(date = Date, close = Close) %>%
  mutate(close_ytd_avg = cumsum(close) / seq_along(close),
         close_six_day_window = rollmean(close, 6, fill = NA))

knitr::kable(head(bitcoins_close))
```

date	close	close_ytd_avg	close_six_day_window
2022-01-01	47686.81	47686.81	NA
2022-01-02	47345.22	47516.02	NA
2022-01-03	46458.12	47163.38	45686.28
2022-01-04	45897.57	46846.93	44664.79
2022-01-05	43569.00	46191.35	43729.58
2022-01-06	43160.93	45686.28	42971.83

Information on "zoo" package and `rollmean()` function found here.

I combined the two tables:

```
bitcoins_open_close <- inner_join(bitcoins_open, bitcoins_close, on = "Date")
```

```
## Joining, by = "date"
```

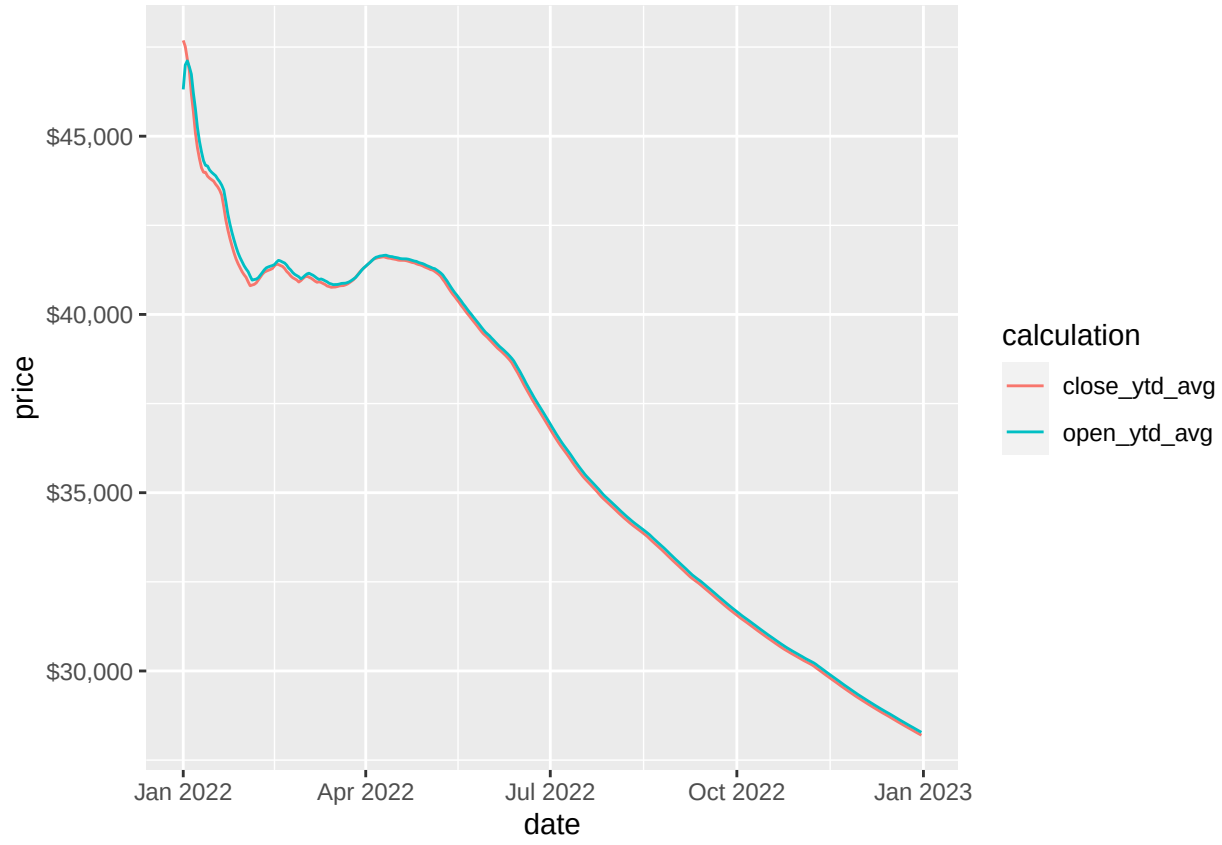
```
knitr::kable(head(bitcoins_open_close))
```

date	open	open_ytd_avg	open_six_day_window	close	close_ytd_avg	close_six_day_window
2022-01-01	46311.75	46311.75	NA	47686.81	47686.81	NA
2022-01-02	47680.93	46996.34	NA	47345.22	47516.02	NA
2022-01-03	47343.54	47112.07	46209.99	46458.12	47163.38	45686.28
2022-01-04	46458.85	46948.77	45683.63	45897.57	46846.93	44664.79
2022-01-05	45899.36	46738.89	44663.72	43569.00	46191.35	43729.58
2022-01-06	43565.51	46209.99	43728.91	43160.93	45686.28	42971.83

Some Visualization

I plotted the `open_ytd_avg` and `close_ytd_avg`. I used pivot longer to be able to plot both values on the same graph, differentiated by color.

```
bitcoins_open_close %>%
  pivot_longer(cols = c("open_ytd_avg", "close_ytd_avg"),
               names_to = "calculation",
               values_to = "price") %>%
  ggplot(aes(x = date, y = price, color = calculation)) +
  geom_line() +
  scale_y_continuous(labels = dollar_format())
```



You can see the decrease in the price of Bitcoin over the 2022 year.