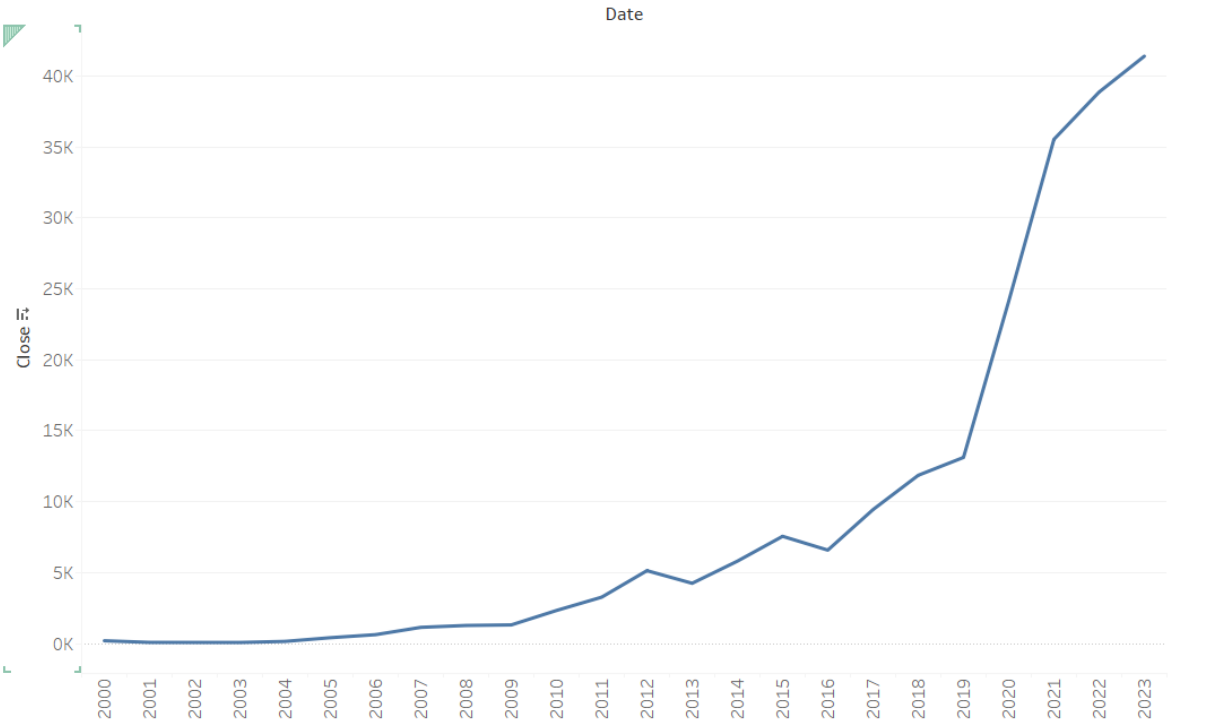
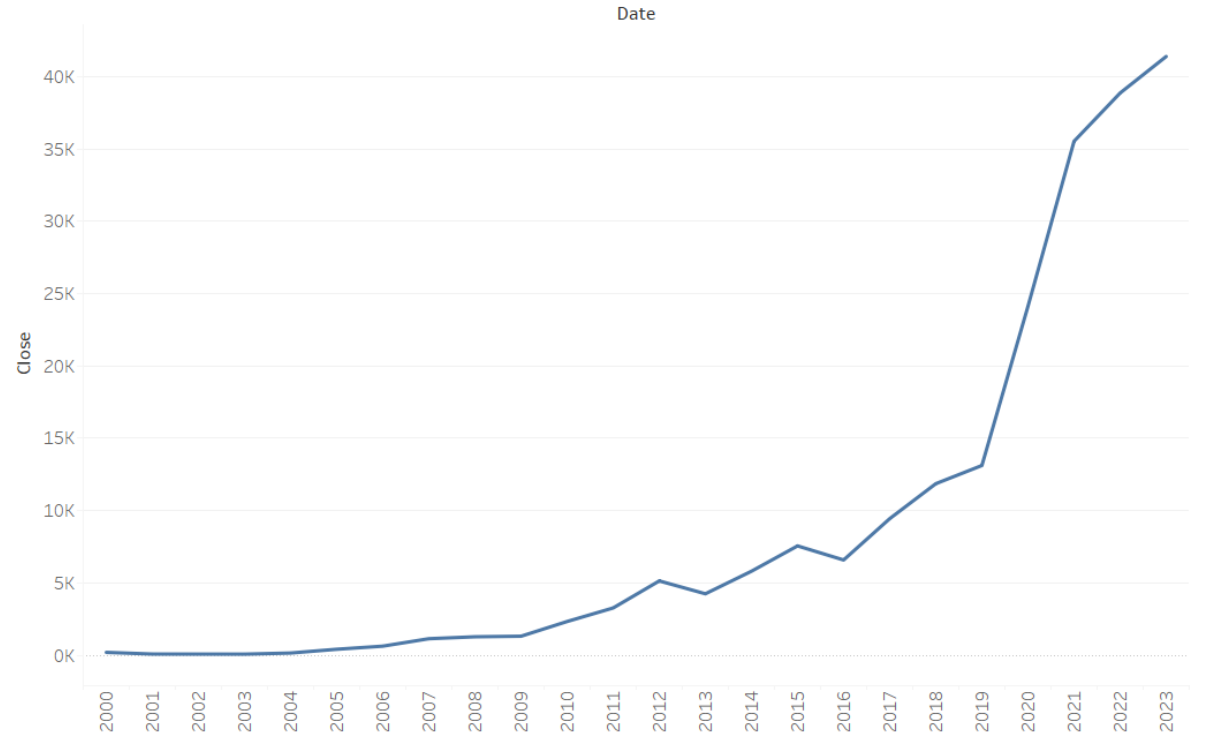
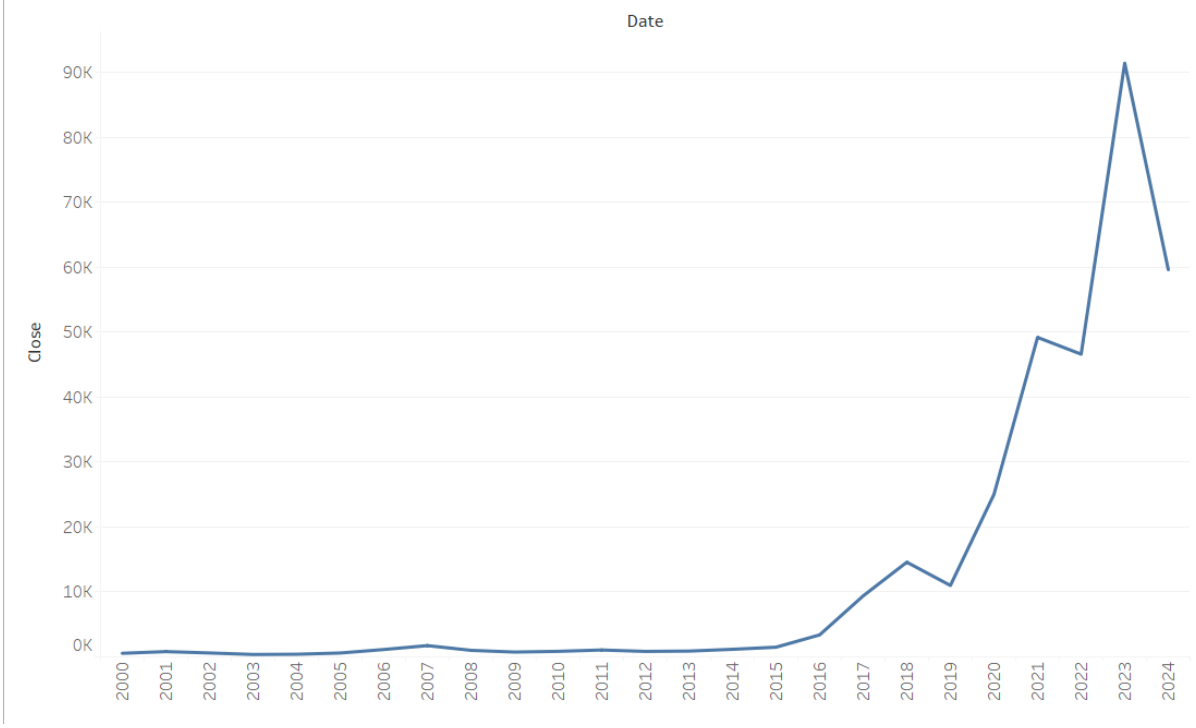
Microsoft Close Trend



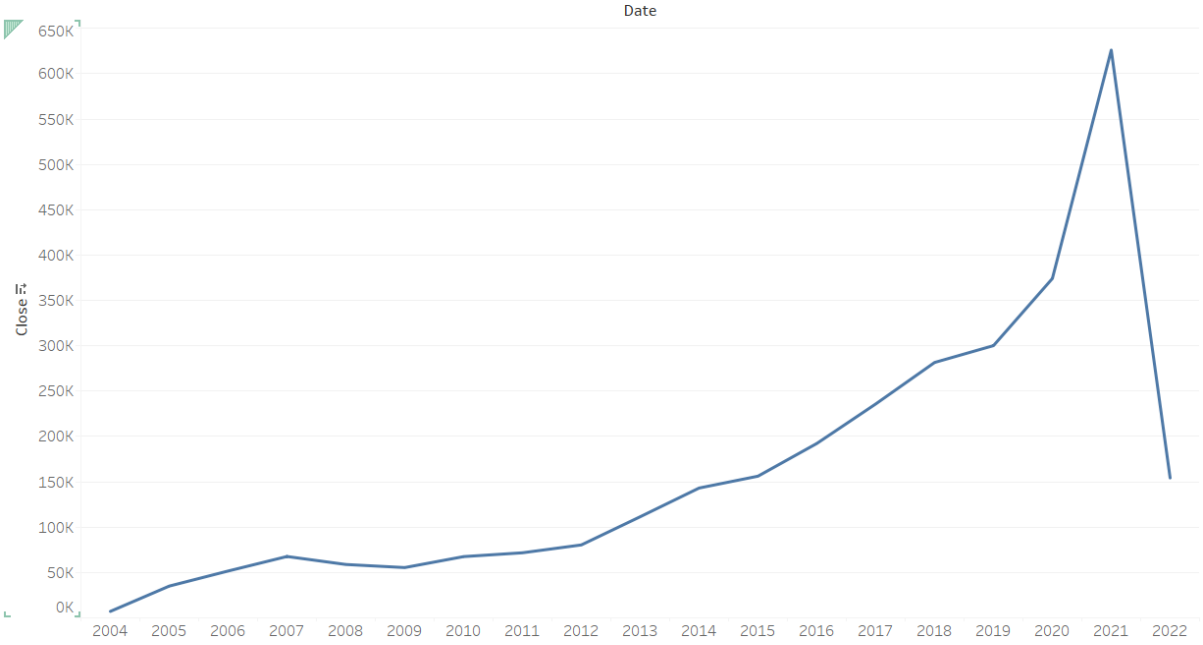
Apple Close Trend



Nvidia Close Trend



Google Close Trend



apple | cor_matrix | Early Week 1 code.R

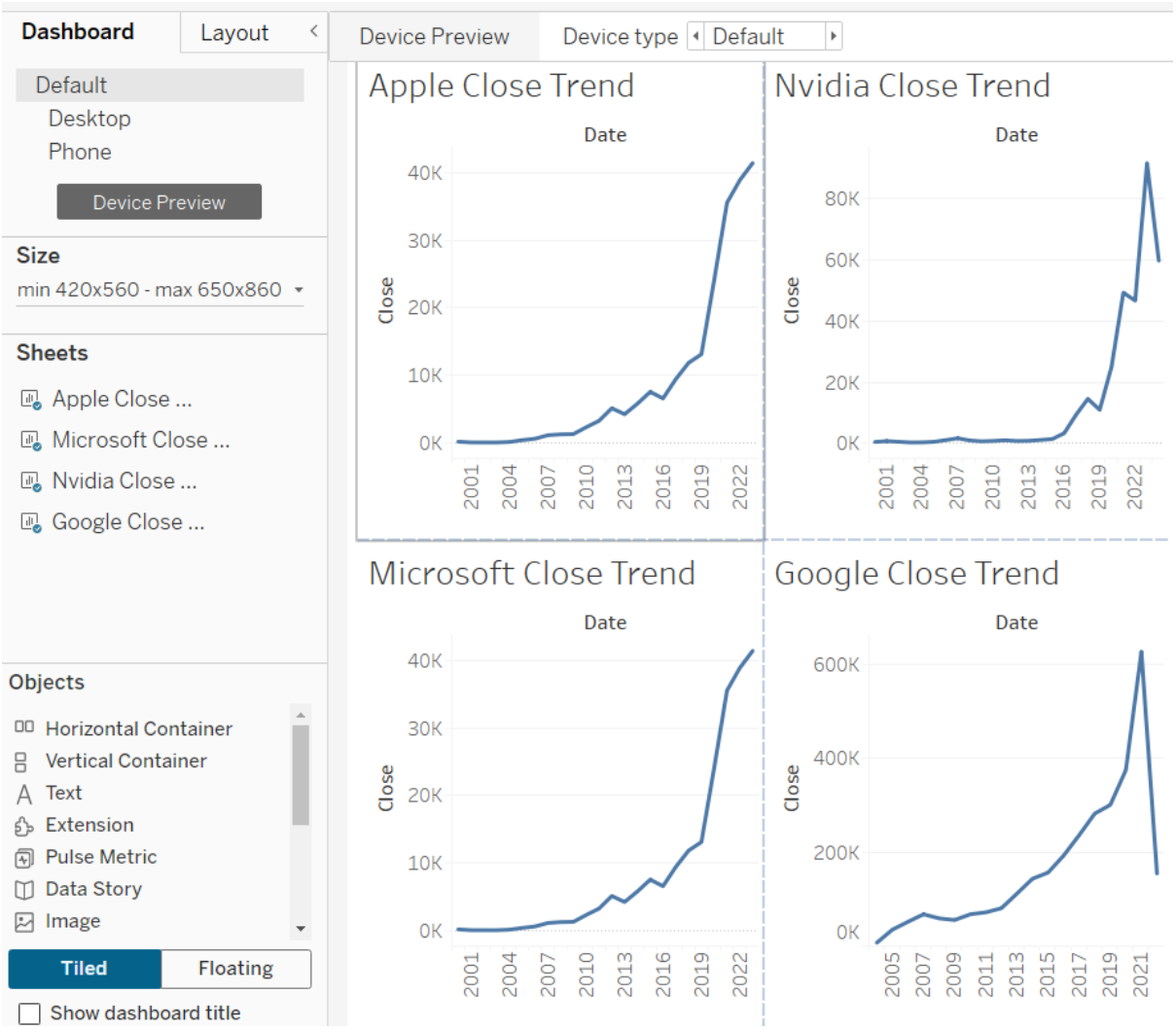
Filter

	Apple	Microsoft	Nvidia	Google
Apple	1.0000000	0.5018113	0.4482072	0.5027794
Microsoft	0.5018113	1.0000000	0.4970097	0.5397538
Nvidia	0.4482072	0.4970097	1.0000000	0.4328178
Google	0.5027794	0.5397538	0.4328178	1.0000000

apple | cor_matrix | risk_summary | Early Week

Filter

	Stock	Standard Deviation	Beta (vs Apple)
1	apple	0.02082449	1.0000000
2	microsoft	0.01711601	0.4087743
3	nvidia	0.03084508	0.6448185
4	google	0.01908313	0.4591066




```
> 
> # Correlation matrix
> cor_matrix <- cor(returns_df %>% select(-Date))
> print(cor_matrix)
              Apple Microsoft    Nvidia    Google
Apple     1.0000000 0.5018113 0.4482072 0.5027794
Microsoft 0.5018113 1.0000000 0.4970097 0.5397538
Nvidia    0.4482072 0.4970097 1.0000000 0.4328178
Google    0.5027794 0.5397538 0.4328178 1.0000000
> 
```

```
[1] 0.01908313
> 
> # Create a table for the standard deviation
> tibble(
+   Stock = c("Apple", "Microsoft", "Nvidia", "Google"),
+   `Standard Deviation` = c(apple_sd, microsoft_sd, nvidia_sd, google_sd)
+ )
# A tibble: 4 × 2
  Stock     `Standard Deviation`
  <chr>                    <dbl>
1 Apple                   0.0208
2 Microsoft               0.0171
3 Nvidia                  0.0308
4 Google                  0.0191
> 
```

Early Week 1 code.R | risk_summary | cor_matrix

Filter

	Stock	Standard Deviation	Beta (vs Apple)
1	apple	0.02082449	1.0000000
2	microsoft	0.01711601	0.4087743
3	nvidia	0.03084508	0.6448185
4	google	0.01908313	0.4591066

```
print(risk_summary)

apple <- apple %>% select(Date, Close, Volume, Return)
microsoft <- microsoft %>% select(Date, Close, Volume, Return)
nvidia <- nvidia %>% select(Date, Close, Volume, Return)
google <- google %>% select(Date, Close, Volume, Return)
```

Go to file/function

Early Week 1 code.R* | google

Filter

	Date	Close	Volume	Return
4413	2022-02-28	2701.14	1939400	0.0044436995
4414	2022-03-01	2681.23	1324800	-0.0073709300
4415	2022-03-02	2691.43	1176000	0.0038042063
4416	2022-03-03	2677.99	1230200	-0.0049936065
4417	2022-03-04	2638.13	1521500	-0.0148843376
4418	2022-03-07	2527.57	2255600	-0.0419084048
4419	2022-03-08	2542.09	2021400	0.0057446558
4420	2022-03-09	2668.40	1851300	0.0496873870
4421	2022-03-10	2648.59	1355100	-0.0074238550
4422	2022-03-11	2597.41	1572700	-0.0193235549
4423	2022-03-14	2519.02	1940600	-0.0301800234
4424	2022-03-15	2583.96	1546000	0.0257798431
4425	2022-03-16	2665.61	1778800	0.0315988433
4426	2022-03-17	2676.78	1413200	0.0041903810
4427	2022-03-18	2722.51	2223100	0.0170839518
4428	2022-03-21	2722.03	1341600	-0.0001763009
4429	2022-03-22	2797.36	1774800	0.0276742274
4430	2022-03-23	2765.51	1257700	-0.0113857694
4431	2022-03-24	2831.44	1317900	0.0238400623

Early Week 1 code.R* | google | apple

Filter

	Date	Close	Volume	Return
4653	2022-06-27	141.66	70207900	0.0000000000
4654	2022-06-28	137.44	67083400	-0.0297896504
4655	2022-06-29	139.23	66242400	0.0130238211
4656	2022-06-30	136.72	98964500	-0.0180276885
4657	2022-07-01	138.93	71051600	0.0161643650
4658	2022-07-05	141.56	73353800	0.0189304335
4659	2022-07-06	142.92	74064300	0.0096072338
4660	2022-07-07	146.35	66253700	0.0239994966
4661	2022-07-08	147.04	64547800	0.0047146360
4662	2022-07-11	144.87	63141600	-0.0147578761
4663	2022-07-12	145.86	77588800	0.0068337546
4664	2022-07-13	145.49	71185600	-0.0025366516
4665	2022-07-14	148.47	78140700	0.0204824792
4666	2022-07-15	150.17	76259900	0.0114501043
4667	2022-07-18	147.07	81420900	-0.0206432113
4668	2022-07-19	151.00	82982400	0.0267219203
4669	2022-07-20	153.04	64823400	0.0135098874
4670	2022-07-21	155.35	65086600	0.0150941787
4671	2022-07-22	154.09	66675400	-0.0081107818

Early Week 1 code.R* × microsoft ×

Filter

	Date	Close	Volume	Return
4638	2022-06-03	270.02	28059000	-0.0166071754
4639	2022-06-06	268.75	22400300	-0.0047033148
4640	2022-06-07	272.50	22860700	0.0139534884
4641	2022-06-08	270.41	17372300	-0.0076697101
4642	2022-06-09	264.79	26439700	-0.0207832363
4643	2022-06-10	252.99	31422800	-0.0445636300
4644	2022-06-13	242.26	46135800	-0.0424127823
4645	2022-06-14	244.49	28651500	0.0092050278
4646	2022-06-15	251.76	33111700	0.0297353260
4647	2022-06-16	244.97	33169200	-0.0269701070
4648	2022-06-17	247.65	43084800	0.0109400865
4649	2022-06-21	253.74	29928300	0.0245912019
4650	2022-06-22	253.13	25939900	-0.0024040356
4651	2022-06-23	258.86	25861400	0.0226365104
4652	2022-06-24	267.70	33923200	0.0341498397
4653	2022-06-27	264.89	24615100	-0.0104968131
4654	2022-06-28	256.48	27295500	-0.0317490412
4655	2022-06-29	260.26	20069800	0.0147379867
4656	2022-06-30	256.83	31730900	-0.0131792164

Showing 4,638 to 4,656 of 5,008 entries, 4 total columns

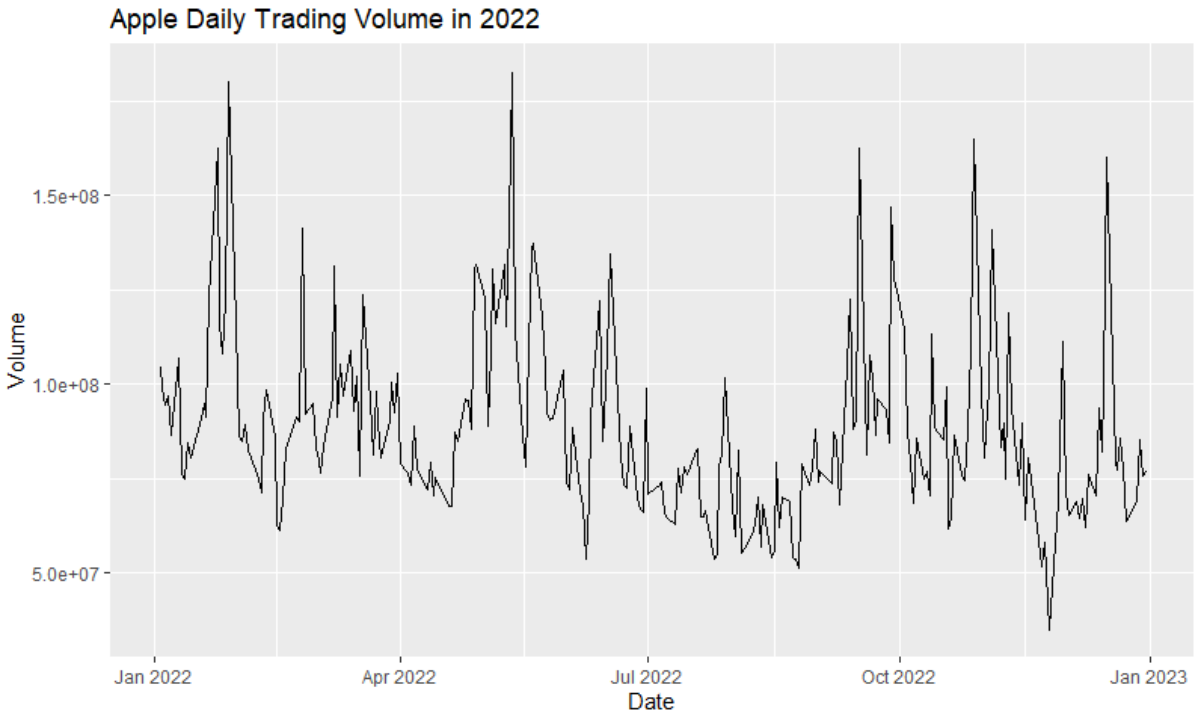
Early Week 1 code.R* × nvidia ×

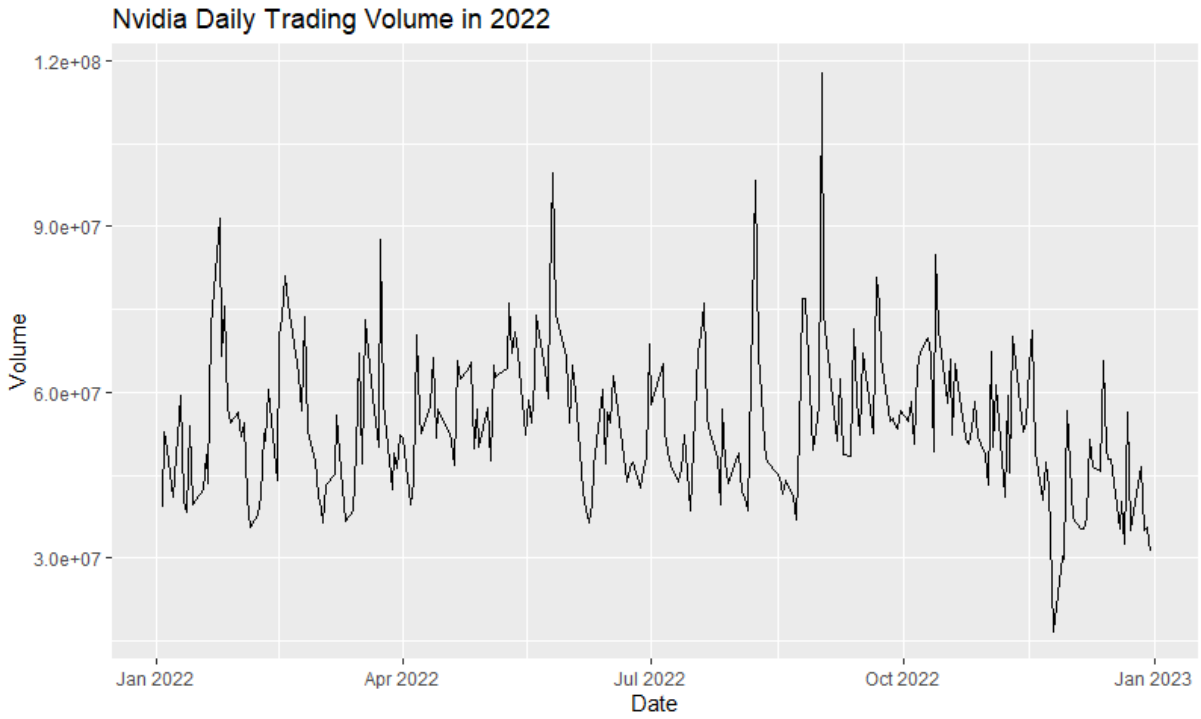
Filter

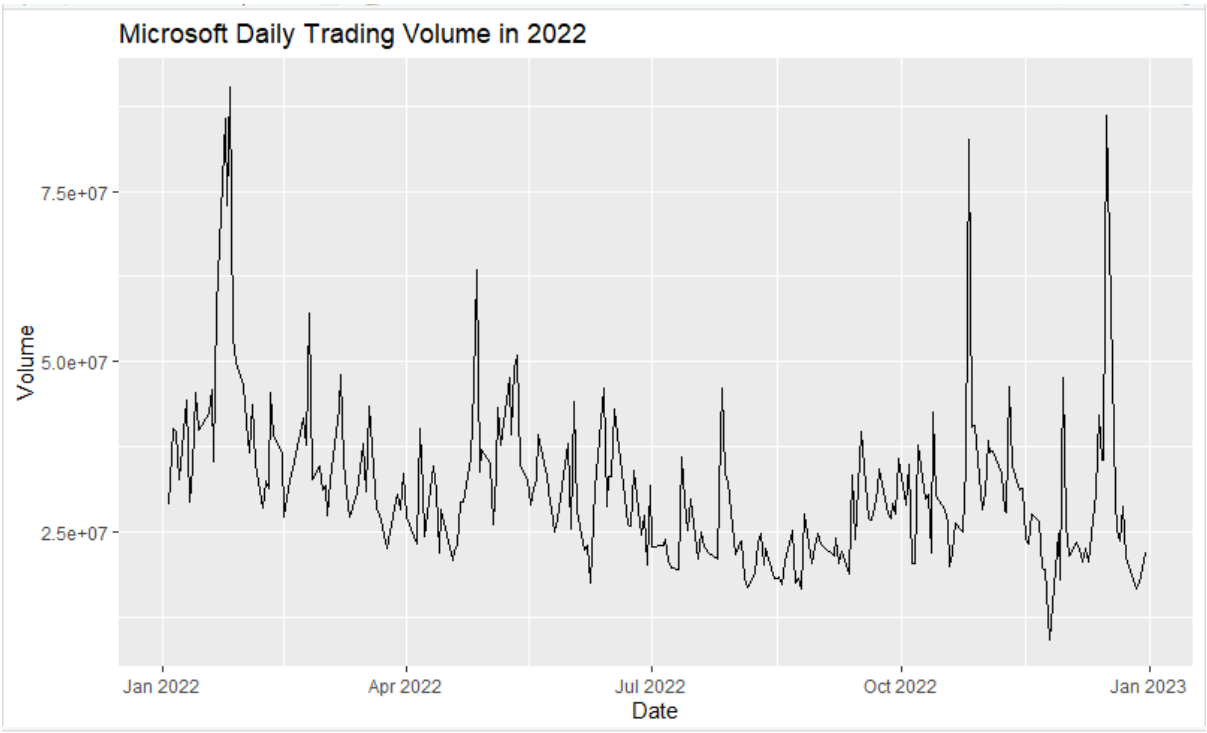
	Date	Close	Volume	Return
4574	2022-03-03	237.14	36509500	-2.089182e-02
4575	2022-03-04	229.36	43141500	-3.280762e-02
4576	2022-03-07	213.52	45082100	-6.906172e-02
4577	2022-03-08	215.14	55746700	7.587088e-03
4578	2022-03-09	230.14	49274200	6.972204e-02
4579	2022-03-10	226.58	42806600	-1.546883e-02
4580	2022-03-11	221.00	36720900	-2.462707e-02
4581	2022-03-14	213.30	38535400	-3.484162e-02
4582	2022-03-15	229.73	49199600	7.702763e-02
4583	2022-03-16	244.96	67142200	6.629527e-02
4584	2022-03-17	247.66	47194100	1.102220e-02
4585	2022-03-18	264.53	73071900	6.811756e-02
4586	2022-03-21	267.34	59172700	1.062260e-02
4587	2022-03-22	265.24	54700700	-7.855188e-03
4588	2022-03-23	256.34	50212000	-3.355450e-02
4589	2022-03-24	281.50	87737900	9.815091e-02
4590	2022-03-25	276.92	57901600	-1.626994e-02
4591	2022-03-28	282.19	42549400	1.903073e-02
4592	2022-03-29	286.56	48898400	1.548601e-02

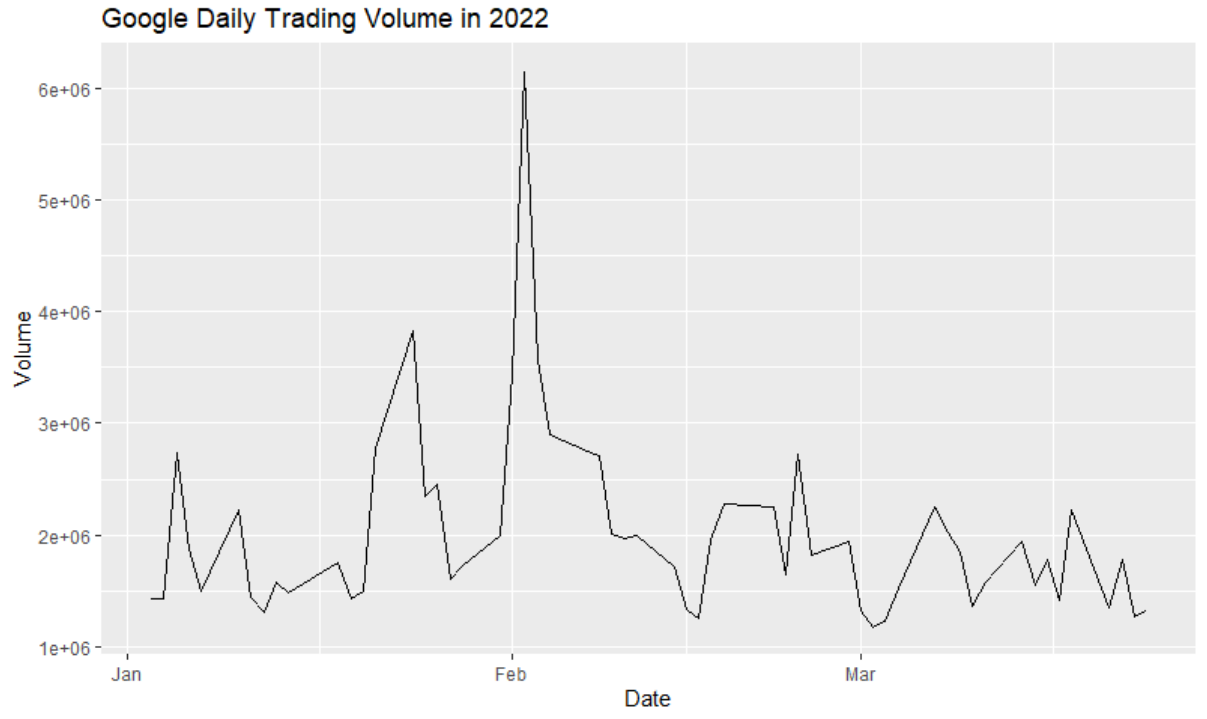
Showing 4,574 to 4,592 of 5,033 entries, 4 total columns

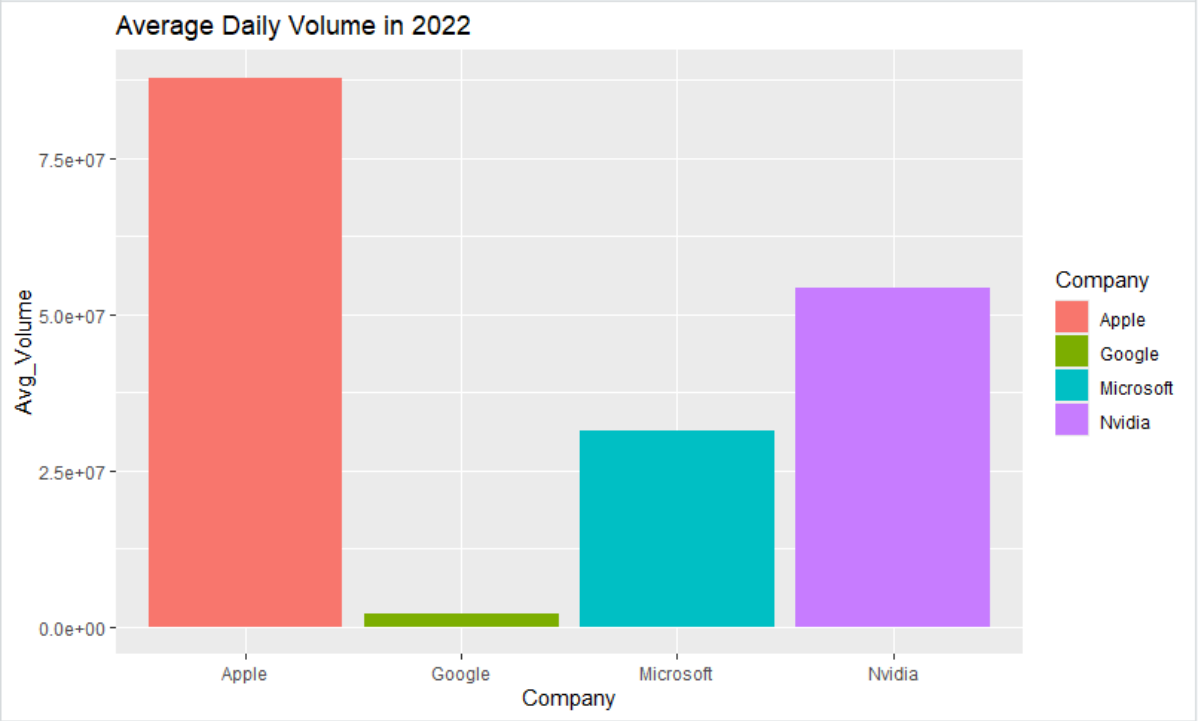
```r
# Creating line graph for each 4 big tech companies for volume value in year 2022

Apple_2022 <- apple %>% filter(year(Date) == 2022)
ggplot(apple_2022, aes(x = Date, y = Volume)) +
  geom_line() +
  ggtitle("Apple Daily Trading Volume in 2022")

Nvidia_2022 <- nvidia %>% filter(year(Date) == 2022)
ggplot(Nvidia_2022, aes(x = Date, y = Volume)) +
  geom_line() +
  ggtitle("Nvidia Daily Trading Volume in 2022")

Google_2022 <- google %>% filter(year(Date) == 2022)
ggplot(Google_2022, aes(x = Date, y = Volume)) +
  geom_line() +
  ggtitle("Google Daily Trading Volume in 2022")

Microsoft_2022 <- microsoft %>% filter(year(Date) == 2022)
ggplot(Microsoft_2022, aes(x = Date, y = Volume)) +
  geom_line() +
  ggtitle("Microsoft Daily Trading Volume in 2022")
```




Nvidia Daily Trading Volume in 2022
1.2e+08
9.0e+07
6.0e+07
3.0e+07
Volume
Jan 2022
Apr 2022
Jul 2022
Oct 2022
Jan 2023
Date


Microsoft Daily Trading Volume in 2022
Volume
7.5e+07
5.0e+07
2.5e+07
Jan 2022
Apr 2022
Jul 2022
Oct 2022
Jan 2023
Date


Google Daily Trading Volume in 2022
Volume
6e+06
5e+06
4e+06
3e+06
2e+06
1e+06
Jan
Feb
Mar
Date




```
> apple %>% arrange(desc(Volume_Change)) %>% slice_head(n = 10)
# A tibble: 10 × 9
   Date          Open   High    Low  Close `Adj Close`     Volume    Return Volume_Change
   <date>       <dbl>  <dbl>  <dbl>  <dbl>       <dbl>      <dbl>     <dbl>         <dbl>
 1 2011-01-18  11.8   12.3   11.6   12.2         10.3   1880998000 -0.0225           5.09
 2 2005-05-11   1.26   1.27   1.18   1.27         1.08  2041981200 -0.0222           3.64
 3 2007-01-09   3.09   3.32   3.04   3.31         2.80  3349298400  0.0831           3.20
 4 2014-09-09  24.8   25.8   24.0   24.5         21.8    759385200 -0.00376          3.10
 5 2006-12-27   2.79   2.93   2.74   2.91         2.47  1935754800  0.000123         2.94
 6 2005-09-06   1.67   1.75   1.66   1.74         1.48   818619200  0.0558           2.68
 7 2020-11-30 117.   121.   117.   119.         117.      169410200  0.0211           2.63
 8 2018-09-21  55.2   55.3   54.3   54.4         52.0    384986800 -0.0108           2.62
 9 2014-12-01  29.7   29.8   27.8   28.8         25.8    335256000 -0.0325           2.38
10 2006-01-10   2.72   2.92   2.71   2.89         2.45  2279869200  0.0632           2.38
> 
```

```
> microsoft %>% arrange(desc(Volume_Change)) %>% slice_head(n = 10)
# A tibble: 10 × 9
   Date        Open  High   Low Close `Adj Close`    Volume   Return Volume_Change
   <date>     <dbl> <dbl> <dbl> <dbl>       <dbl>     <dbl>    <dbl>         <dbl>
 1 2013-08-23  35.2  35.2  34    34.8         29.0 225493800  0.0729           6.23
 2 2015-11-30  54.5  55.0  54    54.3         48.3  56241400  0.00779          5.24
 3 2006-04-28  24.2  24.5  24    24.2         17.1 591052200 -0.114            5.12
 4 2014-09-19  46.8  47.6  46.6  47.5         40.9 202522400  0.0180           4.70
 5 2013-07-19  32.4  32.7  31.0  31.4         26.1 248428500 -0.114            4.01
 6 2016-06-24  49.8  50.9  49.5  49.8         44.9 133503000 -0.0401           3.60
 7 2009-10-23  29.2  29.4  27.9  28.0         21.2 281761000  0.0538           3.57
 8 2011-04-29  26.5  26.6  25.4  25.9         20.2 319317900 -0.0296           2.98
 9 2015-01-27  43.0  43.2  42.1  42.7         36.9 169164000 -0.0925           2.98
10 2013-09-03  31.8  32.1  31.3  31.9         26.6 154507000 -0.0455           2.61
```

```
> nvidia %>% arrange(desc(Volume_Change)) %>% slice_head(n = 10)
# A tibble: 10 × 9
   Date          Open   High    Low   Close `Adj Close`    Volume  Return Volume_Change
   <date>       <dbl>  <dbl>  <dbl>   <dbl>       <dbl>     <dbl>   <dbl>         <dbl>
 1 2004-08-06   0.842   0.85  0.775   0.786       0.721 508894800 -0.352            4.92
 2 2021-11-04 272.    314.   271.    298.        298.    115363100  0.120            3.81
 3 2004-10-26   1.22    1.27  1.18    1.21        1.11  245577600  0.0862           3.64
 4 2010-08-19   2.36    2.48  2.34    2.47        2.27  161510000  0.0601           3.58
 5 2021-04-12 143.    154.   141.    152.        152.     86932400  0.0562           3.45
 6 2006-03-21   4.23    4.31  4.12    4.23        3.88  123547200  0.0494           3.21
 7 2013-08-14   3.60    3.78  3.60    3.76        3.51   82850800  0.0423           3.20
 8 2006-11-27   6.13    6.21  5.84    5.88        5.40   58529400 -0.0452           3.06
 9 2010-09-21   2.66    2.87  2.66    2.82        2.59  177962400  0.0542           3.02
10 2005-02-02   2.02    2.07  1.96    2.05        1.88  203540400  0.0557           3.01
> google %>% arrange(desc(Volume_Change)) %>% slice_head(n = 10)
```

```
# A tibble: 10 × 9
   Date        Open  High   Low Close `Adj Close`    Volume   Return Volume_Change
   <date>     <dbl> <dbl> <dbl> <dbl>       <dbl>     <dbl>    <dbl>         <dbl>
 1 2012-10-18  378.  380.  338.  348.         348.  24859915 -0.0801           4.43
 2 2006-11-27  251.  251.  243.  243.         243.  14634751 -0.0401           3.23
 3 2016-11-28  778.  800.  778.  786.         786.   2575400  0.00713          3.20
 4 2020-06-26 1433. 1437. 1355  1363.        1363.   4882000 -0.0545           3.08
 5 2006-02-28  197.  199.  169.  181.         181.  78796325 -0.0711           2.86
 6 2010-05-04  264.  264.  252.  253.         253.  12140447 -0.0457           2.27
 7 2015-08-11  700.  704   684.  690.         690.   5494000  0.0410           2.19
 8 2018-09-21 1195. 1197. 1172. 1172.        1172.   4561100 -0.0163           2.12
 9 2019-06-03 1067. 1067  1027. 1039.        1039.   4844500 -0.0612           2.07
10 2005-08-18  138.  140.  138.  140.         140.  23721854 -0.0179           2.06
>
```

```
# Calculating daily percent change in in total volume and add the extra column in the existing tabl

# Apple company
apple <- apple %>%
  arrange(Date) %>%
  mutate(Volume_Change = (Volume / lag(Volume)) - 1)

# Microsoft company
microsoft <- microsoft %>%
  arrange(Date) %>%
  mutate(Volume_Change = (Volume / lag(Volume)) - 1)

# Nvidia company
nvidia <- nvidia %>%
  arrange(Date) %>%
  mutate(Volume_Change = (Volume / lag(Volume)) - 1)
```

```r
# Google company
google <- google %>%
  arrange(Date) %>%
  mutate(Volume_Change = (Volume / lag(Volume)) - 1)

apple %>% arrange(desc(Volume_Change)) %>% slice_head(n = 10)
microsoft %>% arrange(desc(Volume_Change)) %>% slice_head(n = 10)
nvidia %>% arrange(desc(Volume_Change)) %>% slice_head(n = 10)
google %>% arrange(desc(Volume_Change)) %>% slice_head(n = 10)

#  Compare Volume Spikes with Daily Returns

volume_return_apple <- apple %>%
  arrange(desc(Volume)) %>%
  slice_head(n = 10) %>%
  select(Date, Volume, Return)
```

Early Week 1 code.R* × volume_return_apple ×

Filter

	Date	Volume	Return
1	2008-01-23	3372969600	-0.10646351
2	2007-01-09	3349298400	0.08306994
3	2005-01-13	3164716800	0.06630001
4	2007-01-10	2952880000	0.04785590
5	2004-10-14	2768427200	0.13157261
6	2005-04-14	2753192400	-0.09210528
7	2005-10-12	2697486400	-0.04535739
8	2006-04-06	2663768800	0.05996150
9	2008-09-29	2622057200	-0.17919520
10	2005-01-11	2611627200	-0.06380555

Filter

	Date	Volume	Return
1	2006-01-20	82151167	-0.084751936
2	2006-02-28	78796325	-0.071110255
3	2005-02-14	77047276	0.029829245
4	2004-10-22	73710016	0.154304468
5	2006-03-31	72969757	0.004016045
6	2005-06-01	70313017	0.038698789
7	2005-04-22	66343790	0.056752553
8	2005-02-02	65533001	0.073267370
9	2004-10-25	65462872	0.086817846
10	2005-05-24	58028114	0.002153069

Early Week 1 code.R* | volume_return_microsoft

Filter

	Date	Volume	Return
1	2006-04-28	591052200	-0.11376147
2	2011-04-29	319317900	-0.02957690
3	2008-02-01	291138900	-0.06595083
4	2007-10-26	288121200	0.09502967
5	2009-10-23	281761000	0.05377962
6	2004-04-23	258269000	0.06127167
7	2013-07-19	248428500	-0.11399546
8	2008-10-10	228467500	-0.03587440
9	2013-08-23	225493800	0.07286203
10	2009-01-22	222436600	-0.11713097

Early Week 1 code.R* | volume_return_nvidia

Filter

	Date	Volume	Return
1	2004-08-06	508894800	-0.35233526
2	2004-11-05	384901200	0.14471093
3	2017-06-09	369292800	-0.06464922
4	2011-01-06	349331200	0.13839812
5	2011-02-17	347009600	0.09837468
6	2011-01-12	343189600	0.14967996
7	2011-08-12	319578400	-0.03952274
8	2005-02-18	313212000	0.10819288
9	2008-07-03	298752000	-0.30726567
10	2009-05-08	293056400	-0.13793103