Machine Learning Assignment 1

Meghana Gitay

2023-09-07

```
summary(cars)
```

```
##      speed           dist
##  Min.   : 4.0   Min.   :  2.00
##  1st Qu.:12.0   1st Qu.: 26.00
##  Median :15.0   Median : 36.00
##  Mean   :15.4   Mean   : 42.98
##  3rd Qu.:19.0   3rd Qu.: 56.00
##  Max.   :25.0   Max.   :120.00
```

```
library(readr)
```

```
bitcoin <- read.csv( "C:/Users/gitay/Downloads/dataset.csv")
#mean median mode can be calculated by using summary on given variables
summary(bitcoin)
```

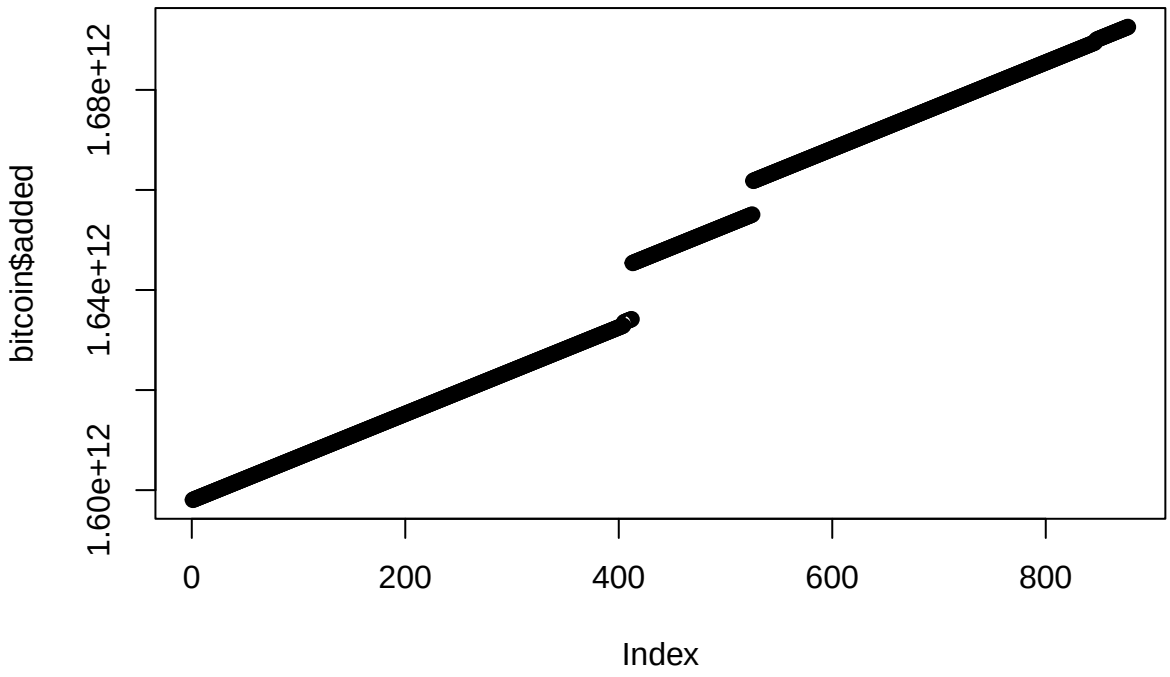
```
##      added           channel_count   total_capacity        tor_nodes
##  Min.   :1.598e+12   Min.   :    0   Min.   :0.000e+00   Min.   :    0
##  1st Qu.:1.617e+12   1st Qu.:33927   1st Qu.:9.014e+10   1st Qu.: 4002
##  Median :1.648e+12   Median :67936   Median :3.109e+11   Median :10229
##  Mean   :1.645e+12   Mean   :58014   Mean   :3.030e+11   Mean   : 7852
##  3rd Qu.:1.673e+12   3rd Qu.:74323   3rd Qu.:5.141e+11   3rd Qu.:10968
##  Max.   :1.693e+12   Max.   :82825   Max.   :5.507e+11   Max.   :11622
##  clearnet_nodes unannounced_nodes clearnet_tor_nodes
##  Min.   :   0   Min.   :   0      Min.   :   0.0
##  1st Qu.:2244   1st Qu.: 953      1st Qu.: 524.0
##  Median :2401   Median : 992      Median :1031.0
##  Mean   :2417   Mean   :1313      Mean   : 918.1
##  3rd Qu.:2629   3rd Qu.:1203      3rd Qu.:1271.0
##  Max.   :2840   Max.   :4487      Max.   :1486.0
```

```
View(bitcoin)
summary(bitcoin$total_capacity)
```

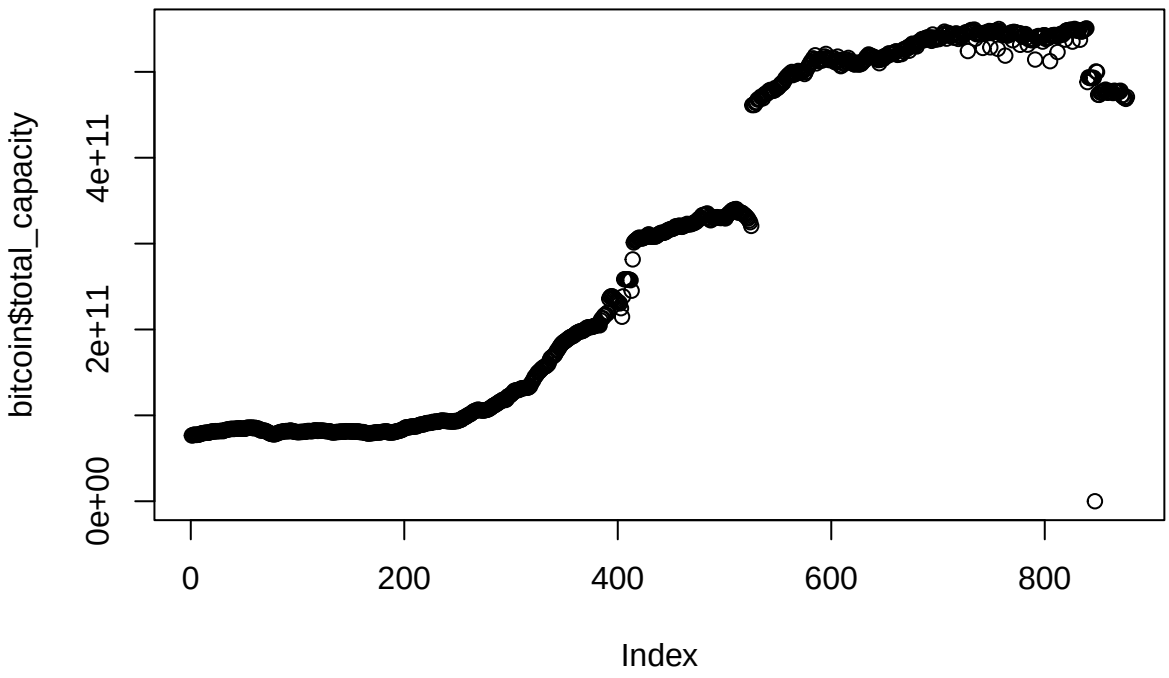
```
##      Min.   1st Qu.    Median      Mean   3rd Qu.      Max.
## 0.000e+00 9.014e+10 3.109e+11 3.030e+11 5.141e+11 5.507e+11
```

by the given data plot has been created

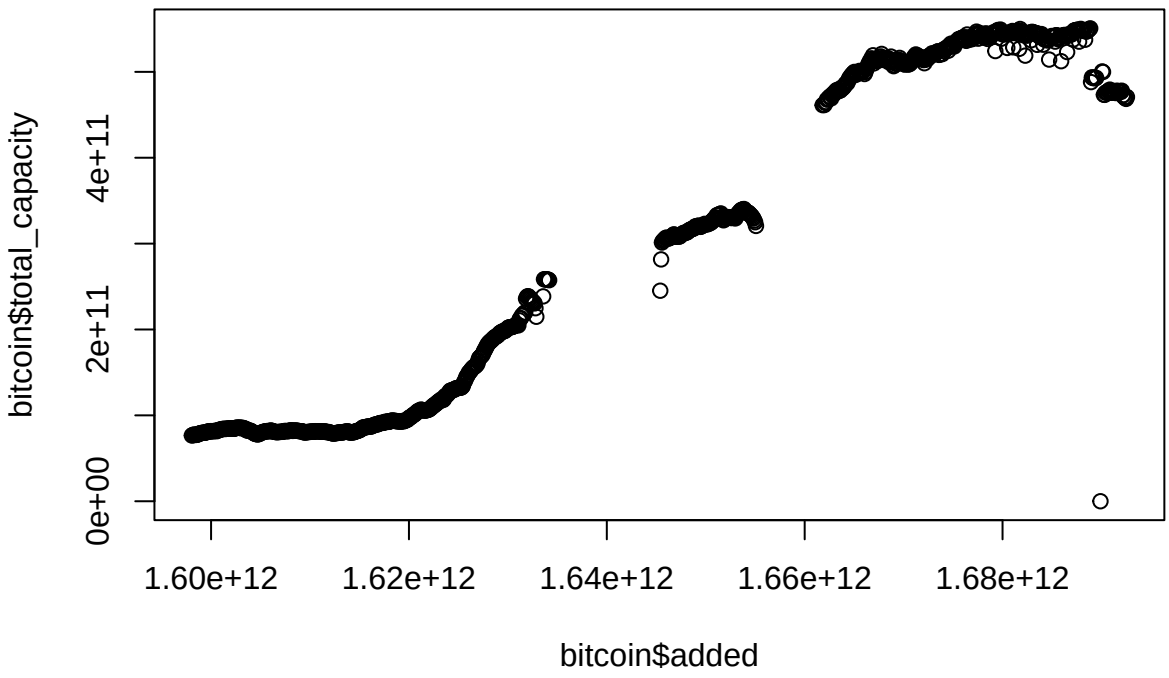
```r
plot(bitcoin$added)
```




```r
plot(bitcoin$total_capacity)
```




```
plot(bitcoin$added,bitcoin$total_capacity)
```



mean is used to calculate average

```
mean(bitcoin$added)
```

```
## [1] 1.644819e+12
```

```
mean(bitcoin$total_capacity)
```

```
## [1] 303006664110
```

median can be used to find out mid value

```
median(bitcoin$added)
```

```
## [1] 1.647648e+12
```

```
median(bitcoin$total_capacity)
```

```
## [1] 3.10862e+11
```

sd can be used to calculate standard deviation

```r
sd(bitcoin$added)
```

```
## [1] 29969448606
```

```r
sd(bitcoin$channel_count)
```

```
## [1] 20423.76
```

log can be used to calculate the log transformation in the given variables

```r
log(bitcoin$added,bitcoin$total_capacity)
```

```
##   [1] 1.121212 1.121079 1.120690 1.120676 1.120911 1.120813 1.120746 1.120566
##   [9] 1.120205 1.119893 1.119735 1.119692 1.119492 1.119477 1.119382 1.119412
##  [17] 1.119436 1.119052 1.118789 1.118678 1.118555 1.118737 1.118419 1.118473
##  [25] 1.118416 1.118444 1.118424 1.118302 1.118230 1.118490 1.118153 1.117883
##  [33] 1.117621 1.117536 1.117366 1.117295 1.117110 1.117069 1.117042 1.117125
##  [41] 1.117055 1.116966 1.116918 1.116838 1.116722 1.116819 1.116842 1.116935
##  [49] 1.117018 1.116961 1.117046 1.116553 1.116360 1.116378 1.116378 1.116459
##  [57] 1.116315 1.116397 1.116759 1.116409 1.116623 1.116893 1.116915 1.117110
##  [65] 1.117960 1.118171 1.118012 1.118193 1.118209 1.118399 1.118726 1.119243
##  [73] 1.119490 1.119939 1.120319 1.120347 1.120581 1.120661 1.120476 1.120382
##  [81] 1.119863 1.119684 1.119325 1.119080 1.119139 1.118867 1.118639 1.118707
##  [89] 1.118556 1.118489 1.118701 1.118548 1.118206 1.118210 1.118656 1.118763
##  [97] 1.118791 1.119043 1.119112 1.119250 1.119254 1.119153 1.119116 1.119139
## [105] 1.119059 1.119035 1.119054 1.118859 1.118586 1.118527 1.118569 1.118575
## [113] 1.118632 1.118617 1.118377 1.118180 1.118207 1.118211 1.118495 1.118329
## [121] 1.118347 1.118266 1.118328 1.118444 1.118454 1.118571 1.118658 1.118688
## [129] 1.118731 1.118749 1.118946 1.119443 1.119489 1.119427 1.119453 1.119236
## [137] 1.119242 1.119162 1.119183 1.119123 1.118824 1.119040 1.119112 1.119121
## [145] 1.118709 1.118711 1.118736 1.118816 1.118856 1.118908 1.118995 1.118864
## [153] 1.118921 1.119014 1.119098 1.118926 1.118848 1.119283 1.119254 1.119416
## [161] 1.119288 1.119536 1.119672 1.119882 1.120051 1.120302 1.120189 1.120221
## [169] 1.120015 1.119969 1.119961 1.119737 1.119595 1.119548 1.119601 1.119615
## [177] 1.119621 1.119437 1.119286 1.119222 1.119105 1.119039 1.118918 1.118930
## [185] 1.119572 1.119577 1.119643 1.119596 1.119568 1.119602 1.119215 1.119131
## [193] 1.118978 1.118770 1.118611 1.118416 1.118231 1.117972 1.117496 1.117286
## [201] 1.116637 1.116435 1.116511 1.116444 1.116435 1.116043 1.116011 1.115998
## [209] 1.116017 1.116028 1.115888 1.115805 1.115406 1.115154 1.114942 1.114785
## [217] 1.114893 1.114819 1.114446 1.114240 1.114068 1.113967 1.113983 1.113917
## [225] 1.113882 1.113671 1.113344 1.113505 1.113367 1.113066 1.113385 1.113329
## [233] 1.112992 1.112826 1.112660 1.112680 1.112824 1.112852 1.112849 1.112934
## [241] 1.113037 1.113086 1.113042 1.113126 1.113224 1.113248 1.113091 1.112883
## [249] 1.113103 1.112811 1.112653 1.112420 1.112235 1.112003 1.111272 1.111097
## [257] 1.110841 1.110607 1.110087 1.109820 1.109514 1.109320 1.108888 1.108429
## [265] 1.108066 1.107768 1.107668 1.107536 1.107132 1.107332 1.107375 1.107456
## [273] 1.107608 1.107611 1.107534 1.107418 1.107306 1.107192 1.106976 1.106652
## [281] 1.106300 1.105978 1.105500 1.105244 1.105087 1.104658 1.104439 1.104129
## [289] 1.103676 1.103503 1.103306 1.102819 1.102701 1.102754 1.102868 1.102490
## [297] 1.101344 1.101268 1.100964 1.100637 1.100234 1.099776 1.099160 1.099035
## [305] 1.098972 1.098874 1.098875 1.098678 1.098385 1.098178 1.098175 1.098165
## [313] 1.098029 1.097982 1.097943 1.097957 1.097728 1.097319 1.096295 1.095678
```

```
## [321] 1.095152 1.094191 1.093844 1.093359 1.092674 1.092465 1.092152 1.091677
## [329] 1.091408 1.091100 1.090846 1.090708 1.090555 1.090225 1.089922 1.089004
## [337] 1.088222 1.087981 1.087710 1.087501 1.087252 1.086685 1.086094 1.085779
## [345] 1.085266 1.084825 1.084377 1.084105 1.083823 1.083635 1.083465 1.083249
## [353] 1.083011 1.082816 1.082579 1.082436 1.082323 1.082242 1.082020 1.081856
## [361] 1.081529 1.081406 1.081282 1.081118 1.081039 1.081065 1.080975 1.080845
## [369] 1.080619 1.080506 1.080218 1.080127 1.080102 1.080075 1.080063 1.079994
## [377] 1.079914 1.079861 1.079771 1.079595 1.079529 1.079532 1.079673 1.078498
## [385] 1.078111 1.078002 1.077499 1.077264 1.077244 1.076855 1.076763 1.073862
## [393] 1.073506 1.073362 1.073419 1.073702 1.073853 1.074086 1.074323 1.074480
## [401] 1.074645 1.074853 1.075861 1.077738 1.073439 1.070159 1.070168 1.070178
## [409] 1.070189 1.070208 1.070242 1.070351 1.072597 1.066959 1.064233 1.064007
## [417] 1.063894 1.063767 1.063597 1.063493 1.063542 1.063630 1.063634 1.063530
## [425] 1.063485 1.063394 1.063315 1.063133 1.063003 1.063347 1.063365 1.063373
## [433] 1.063321 1.063288 1.063382 1.063312 1.063188 1.063045 1.062960 1.062833
## [441] 1.062800 1.062803 1.062817 1.062744 1.062693 1.062504 1.062441 1.062350
## [449] 1.062295 1.062292 1.062222 1.062202 1.062109 1.061885 1.061898 1.061836
## [457] 1.061905 1.061763 1.061932 1.061966 1.061914 1.061784 1.061766 1.061663
## [465] 1.061537 1.061611 1.061601 1.061588 1.061587 1.061466 1.061447 1.061404
## [473] 1.061254 1.061205 1.060978 1.060882 1.060727 1.060655 1.060362 1.060302
## [481] 1.060348 1.060248 1.060149 1.060108 1.060680 1.060941 1.061073 1.060962
## [489] 1.060716 1.060632 1.060704 1.060711 1.060631 1.060710 1.060743 1.060758
## [497] 1.060764 1.060687 1.060654 1.060778 1.060826 1.060485 1.060308 1.060194
## [505] 1.060019 1.059931 1.059736 1.059674 1.059610 1.059584 1.059545 1.059728
## [513] 1.060063 1.059979 1.060007 1.060060 1.060147 1.060339 1.060405 1.060553
## [521] 1.060731 1.060893 1.061181 1.061422 1.061957 1.047725 1.047695 1.047718
## [529] 1.047512 1.047427 1.047183 1.047181 1.047140 1.046926 1.046928 1.047082
## [537] 1.046765 1.046653 1.046634 1.046630 1.046425 1.046339 1.046285 1.046406
## [545] 1.046331 1.046364 1.046332 1.046092 1.046143 1.046113 1.045990 1.045888
## [553] 1.045711 1.045719 1.045645 1.045441 1.045241 1.045169 1.045014 1.044967
## [561] 1.044832 1.044791 1.044665 1.044955 1.044837 1.044861 1.044834 1.044671
## [569] 1.044586 1.044708 1.044722 1.044694 1.044658 1.044559 1.044876 1.044696
## [577] 1.044407 1.044323 1.044097 1.043947 1.043764 1.043825 1.043492 1.043607
## [585] 1.043232 1.043945 1.043720 1.043595 1.043674 1.043724 1.043582 1.043691
## [593] 1.043550 1.043353 1.043134 1.043487 1.043546 1.043673 1.043676 1.043652
## [601] 1.043539 1.043499 1.043810 1.043894 1.043798 1.043387 1.043771 1.043681
## [609] 1.044237 1.044157 1.043947 1.044040 1.043819 1.043832 1.043677 1.043519
## [617] 1.043825 1.043793 1.043926 1.043981 1.044068 1.044119 1.043953 1.044048
## [625] 1.043973 1.044138 1.044023 1.044077 1.043965 1.043855 1.043725 1.043702
## [633] 1.043452 1.043453 1.043258 1.043329 1.043391 1.043435 1.043432 1.043521
## [641] 1.043537 1.043602 1.043663 1.043768 1.044043 1.043746 1.043598 1.043504
## [649] 1.043655 1.043506 1.043385 1.043364 1.043399 1.043195 1.043265 1.043233
## [657] 1.043263 1.043185 1.043147 1.043061 1.043033 1.043347 1.043322 1.043275
## [665] 1.043245 1.043285 1.043022 1.042865 1.042851 1.042899 1.042810 1.042680
## [673] 1.043010 1.042690 1.042527 1.042415 1.042465 1.042629 1.042472 1.042656
## [681] 1.042366 1.042260 1.042229 1.042180 1.042045 1.042055 1.042144 1.041990
## [689] 1.041949 1.041916 1.042061 1.042060 1.041910 1.042211 1.041685 1.041959
## [697] 1.041964 1.042121 1.041997 1.041925 1.042078 1.042010 1.041963 1.041692
## [705] 1.041720 1.041469 1.041595 1.042056 1.041690 1.041593 1.041832 1.041838
## [713] 1.041827 1.041735 1.041990 1.041714 1.041630 1.041805 1.042098 1.041859
## [721] 1.041895 1.041992 1.041727 1.041734 1.041688 1.041556 1.041604 1.043142
## [729] 1.041533 1.041459 1.041383 1.041409 1.041490 1.041353 1.042114 1.041738
## [737] 1.041613 1.041725 1.041726 1.041748 1.041725 1.042902 1.041666 1.041626
## [745] 1.041649 1.041613 1.041580 1.041497 1.042865 1.041532 1.041632 1.041547
```

```
## [753] 1.041538 1.041493 1.041481 1.043005 1.041350 1.041523 1.041712 1.041796
## [761] 1.041841 1.041762 1.043606 1.041887 1.041900 1.041876 1.041787 1.041675
## [769] 1.041664 1.042307 1.041608 1.041641 1.041665 1.041707 1.041739 1.041724
## [777] 1.042703 1.041778 1.041980 1.042010 1.041898 1.041815 1.042122 1.042706
## [785] 1.042256 1.042236 1.042322 1.042333 1.042310 1.042351 1.044000 1.042077
## [793] 1.042063 1.041997 1.042056 1.042031 1.042013 1.042474 1.041943 1.041947
## [801] 1.042265 1.042195 1.042192 1.042134 1.044169 1.042032 1.041964 1.041979
## [809] 1.041937 1.042019 1.042014 1.043388 1.042026 1.041920 1.041858 1.041878
## [817] 1.041924 1.041801 1.042348 1.041613 1.041578 1.041570 1.041577 1.041529
## [825] 1.041550 1.042529 1.041574 1.041479 1.041576 1.041564 1.041649 1.041587
## [833] 1.042383 1.041702 1.041703 1.041650 1.041578 1.041512 1.041454 1.046124
## [841] 1.045684 1.045745 1.045763 1.045713 1.045773 1.045744 0.000000 1.045175
## [849] 1.045227 1.047345 1.047359 1.047141 1.047158 1.047108 1.047005 1.046965
## [857] 1.046870 1.047126 1.047180 1.047106 1.047013 1.047049 1.047129 1.047209
## [865] 1.046995 1.047019 1.047049 1.047069 1.047028 1.047119 1.047005 1.047464
## [873] 1.047430 1.047654 1.047687 1.047796 1.047611
```