

# Prova 1 de GED-13

## Questão 1

### Inicialização

```
library(tidyverse)
library(ggplot2)
library(quantmod) # Para usar o "getSymbols"
library(data.table) # Para usar o "shift"
library(ggpubr) # Para usar o "ggarrange" e "annotate_figure"
library(cowplot) # Para fazer "qqplot" junto com histograma
library(gridExtra) # Para inserir tabela no "qqplot"
start <- as.Date("2022-01-01")
end <- as.Date("2022-09-01")
```

### Dados do Dow Jones

```
dados.dj <- quantmod::getSymbols("^DJI",src = "yahoo",from = start,to = end,auto.assign = FALSE)

## Warning: ^DJI download failed; trying again.

## Error in getSymbols.yahoo(Symbols = "^DJI", env = <environment>, verbose = FALSE, : Unable to getYahooFinance data for the symbol '^DJI'
## ^DJI download failed after two attempts. Error message:
## Could not resolve host: query1.finance.yahoo.com

dados.dj

##           DJI.Open DJI.High  DJI.Low DJI.Close DJI.Volume DJI.Adjusted
## 2022-01-03 36321.59 36595.82 36246.45 36585.06 347930000 36585.06
## 2022-01-04 36636.00 36934.84 36636.00 36799.65 435080000 36799.65
## 2022-01-05 36722.60 36952.65 36400.39 36407.11 462040000 36407.11
## 2022-01-06 36409.05 36464.19 36200.68 36236.47 385890000 36236.47
## 2022-01-07 36249.59 36382.84 36111.53 36231.66 356110000 36231.66
## 2022-01-10 36175.21 36175.21 35639.91 36068.87 430680000 36068.87
## 2022-01-11 36058.85 36271.47 35769.38 36252.02 356850000 36252.02
## 2022-01-12 36336.16 36453.49 36168.15 36290.32 310180000 36290.32
## 2022-01-13 36312.49 36513.88 36044.22 36113.62 343640000 36113.62
## 2022-01-14 35996.43 35996.43 35641.49 35911.81 389200000 35911.81
## 2022-01-18 35661.76 35661.76 35262.02 35368.47 427260000 35368.47
## 2022-01-19 35412.30 35547.83 35015.49 35028.65 393080000 35028.65
## 2022-01-20 35102.66 35490.20 34670.12 34715.39 369070000 34715.39
## 2022-01-21 34701.69 34896.67 34229.55 34265.37 523880000 34265.37
## 2022-01-24 34070.61 34420.99 33150.33 34364.50 664010000 34364.50
## 2022-01-25 34186.64 34591.04 33545.52 34297.73 506430000 34297.73
## 2022-01-26 34520.82 34815.67 33876.48 34168.09 546330000 34168.09
## 2022-01-27 34261.75 34773.32 34007.78 34160.78 527780000 34160.78
## 2022-01-28 34135.24 34731.77 33807.51 34725.47 568440000 34725.47
## 2022-01-31 34691.17 35148.14 34496.10 35131.86 468070000 35131.86
```

##	2022-02-01	35151.47	35441.09	34977.95	35405.24	386080000	35405.24
##	2022-02-02	35378.19	35679.20	35290.12	35629.33	359540000	35629.33
##	2022-02-03	35520.08	35535.94	35071.06	35111.16	381020000	35111.16
##	2022-02-04	35095.74	35333.55	34799.08	35089.74	349880000	35089.74
##	2022-02-07	35108.38	35325.01	34993.98	35091.13	328910000	35091.13
##	2022-02-08	35160.68	35544.89	35090.42	35462.78	319190000	35462.78
##	2022-02-09	35614.90	35824.28	35614.90	35768.06	333610000	35768.06
##	2022-02-10	35630.81	35800.24	35100.72	35241.59	411620000	35241.59
##	2022-02-11	35267.89	35431.15	34620.52	34738.06	398860000	34738.06
##	2022-02-14	34694.50	34744.56	34304.28	34566.17	370320000	34566.17
##	2022-02-15	34686.19	35047.79	34686.19	34988.84	305670000	34988.84
##	2022-02-16	34951.83	35042.09	34642.64	34934.27	294410000	34934.27
##	2022-02-17	34858.47	34858.47	34246.23	34312.03	348720000	34312.03
##	2022-02-18	34310.45	34423.58	33976.18	34079.18	414080000	34079.18
##	2022-02-22	33974.09	34024.74	33364.29	33596.61	432090000	33596.61
##	2022-02-23	33680.97	33832.59	33084.90	33131.76	370600000	33131.76
##	2022-02-24	32830.33	33269.34	32272.64	33223.83	590850000	33223.83
##	2022-02-25	33277.22	34095.74	33277.22	34058.75	417630000	34058.75
##	2022-02-28	33870.62	33963.63	33469.31	33892.60	443460000	33892.60
##	2022-03-01	33813.48	33870.14	33107.67	33294.95	438730000	33294.95
##	2022-03-02	33379.51	34013.67	33379.51	33891.35	400920000	33891.35
##	2022-03-03	33972.87	34179.07	33641.53	33794.66	369740000	33794.66
##	2022-03-04	33655.43	33655.43	33254.12	33614.80	408390000	33614.80
##	2022-03-07	33579.75	33579.75	32806.15	32817.38	488400000	32817.38
##	2022-03-08	32885.17	33402.98	32578.73	32632.64	553750000	32632.64
##	2022-03-09	32860.42	33457.28	32860.42	33286.25	418670000	33286.25
##	2022-03-10	33106.77	33236.59	32819.76	33174.07	399480000	33174.07
##	2022-03-11	33279.72	33515.61	32911.89	32944.19	369480000	32944.19
##	2022-03-14	33000.37	33395.59	32818.16	32945.24	394940000	32945.24
##	2022-03-15	32989.27	33620.84	32989.27	33544.34	388810000	33544.34
##	2022-03-16	33653.93	34075.94	33391.24	34063.10	427400000	34063.10
##	2022-03-17	33995.39	34483.92	33896.06	34480.76	339470000	34480.76
##	2022-03-18	34466.72	34755.20	34279.83	34754.93	615420000	34754.93
##	2022-03-21	34669.85	34808.28	34341.81	34552.99	408490000	34552.99
##	2022-03-22	34583.24	34882.03	34583.24	34807.46	368550000	34807.46
##	2022-03-23	34748.84	34748.84	34352.96	34358.50	347880000	34358.50
##	2022-03-24	34406.81	34713.56	34355.42	34707.94	324870000	34707.94
##	2022-03-25	34702.39	34942.70	34631.52	34861.24	285440000	34861.24
##	2022-03-28	34833.03	34957.93	34552.23	34955.89	299790000	34955.89
##	2022-03-29	35114.35	35372.26	35030.07	35294.19	355050000	35294.19
##	2022-03-30	35273.63	35361.36	35058.58	35228.81	317320000	35228.81
##	2022-03-31	35201.52	35201.52	34677.99	34678.35	433400000	34678.35
##	2022-04-01	34740.89	34847.91	34538.25	34818.27	340400000	34818.27
##	2022-04-04	34799.98	34940.78	34615.38	34921.88	316570000	34921.88
##	2022-04-05	34876.33	35112.21	34566.04	34641.18	304010000	34641.18
##	2022-04-06	34520.34	34609.84	34277.17	34496.51	386250000	34496.51

##	2022-04-07	34439.24	34705.83	34190.95	34583.57	319870000	34583.57
##	2022-04-08	34569.24	34908.46	34470.19	34721.12	301750000	34721.12
##	2022-04-11	34630.27	34701.34	34272.29	34308.08	333290000	34308.08
##	2022-04-12	34412.51	34669.97	34102.81	34220.36	333510000	34220.36
##	2022-04-13	34166.64	34598.36	34140.64	34564.59	313630000	34564.59
##	2022-04-14	34628.46	34889.17	34437.50	34451.23	353680000	34451.23
##	2022-04-18	34411.49	34618.29	34279.08	34411.69	264110000	34411.69
##	2022-04-19	34394.62	34983.11	34394.62	34911.20	296350000	34911.20
##	2022-04-20	34962.67	35315.40	34962.67	35160.79	337620000	35160.79
##	2022-04-21	35258.80	35492.22	34723.82	34792.76	366390000	34792.76
##	2022-04-22	34727.38	34727.38	33773.39	33811.40	373280000	33811.40
##	2022-04-25	33731.65	34106.01	33323.37	34049.46	416900000	34049.46
##	2022-04-26	33907.49	33909.51	33230.95	33240.18	400020000	33240.18
##	2022-04-27	33450.92	33697.18	33108.89	33301.93	447230000	33301.93
##	2022-04-28	33425.96	34054.79	33248.46	33916.39	440380000	33916.39
##	2022-04-29	33787.01	33919.59	32913.15	32977.21	501560000	32977.21
##	2022-05-02	32978.49	33224.95	32449.87	33061.50	453390000	33061.50
##	2022-05-03	33086.09	33341.58	32914.75	33128.79	364420000	33128.79
##	2022-05-04	33171.80	34117.74	33021.84	34061.06	411060000	34061.06
##	2022-05-05	33854.17	33854.17	32685.10	32997.97	448420000	32997.97
##	2022-05-06	32773.88	33055.84	32474.69	32899.37	416520000	32899.37
##	2022-05-09	32685.17	32685.17	32121.98	32245.70	470770000	32245.70
##	2022-05-10	32504.09	32752.17	31887.89	32160.74	439290000	32160.74
##	2022-05-11	32123.24	32584.02	31798.86	31834.11	458460000	31834.11
##	2022-05-12	31699.04	31914.46	31228.22	31730.30	544240000	31730.30
##	2022-05-13	31963.86	32276.05	31862.79	32196.66	388520000	32196.66
##	2022-05-16	32152.15	32514.02	31928.18	32223.42	330030000	32223.42
##	2022-05-17	32427.00	32689.14	32308.15	32654.59	389310000	32654.59
##	2022-05-18	32468.67	32468.67	31393.95	31490.07	465060000	31490.07
##	2022-05-19	31262.62	31569.13	31016.41	31253.13	517190000	31253.13
##	2022-05-20	31426.94	31515.78	30635.76	31261.90	495510000	31261.90
##	2022-05-23	31395.89	31968.42	31395.89	31880.24	402010000	31880.24
##	2022-05-24	31717.61	32014.86	31365.59	31928.62	382950000	31928.62
##	2022-05-25	31816.31	32254.44	31754.33	32120.28	343460000	32120.28
##	2022-05-26	32248.17	32774.14	32248.17	32637.19	351220000	32637.19
##	2022-05-27	32735.09	33213.62	32682.01	33212.96	328770000	33212.96
##	2022-05-31	33160.59	33240.22	32752.34	32990.12	533560000	32990.12
##	2022-06-01	33156.31	33272.34	32584.76	32813.23	338210000	32813.23
##	2022-06-02	32809.01	33248.61	32509.43	33248.28	333210000	33248.28
##	2022-06-03	32986.32	33135.61	32839.21	32899.70	298570000	32899.70
##	2022-06-06	33032.04	33235.37	32819.50	32915.78	253010000	32915.78
##	2022-06-07	32783.03	33207.45	32641.85	33180.14	270750000	33180.14
##	2022-06-08	33087.07	33156.50	32824.37	32910.90	270470000	32910.90
##	2022-06-09	32828.62	32956.73	32267.78	32272.79	289710000	32272.79
##	2022-06-10	32053.52	32053.52	31387.84	31392.79	362300000	31392.79
##	2022-06-13	31144.91	31144.91	30373.72	30516.74	472290000	30516.74

##	2022-06-14	30592.34	30690.80	30144.23	30364.83	366800000	30364.83
##	2022-06-15	30570.50	31011.97	30185.08	30668.53	392670000	30668.53
##	2022-06-16	30305.74	30305.74	29740.35	29927.07	442910000	29927.07
##	2022-06-17	29912.70	30167.52	29653.29	29888.78	692830000	29888.78
##	2022-06-21	30074.69	30653.98	30074.69	30530.25	376900000	30530.25
##	2022-06-22	30352.57	30777.92	30166.01	30483.13	343490000	30483.13
##	2022-06-23	30570.33	30715.63	30293.40	30677.36	361420000	30677.36
##	2022-06-24	30846.94	31517.29	30846.94	31500.68	465480000	31500.68
##	2022-06-27	31533.60	31598.59	31351.37	31438.26	309910000	31438.26
##	2022-06-28	31549.05	31885.09	30934.33	30946.99	350780000	30946.99
##	2022-06-29	31067.41	31152.96	30894.53	31029.31	269390000	31029.31
##	2022-06-30	30790.00	30979.85	30431.87	30775.43	394070000	30775.43
##	2022-07-01	30737.77	31139.35	30487.79	31097.26	310440000	31097.26
##	2022-07-05	30903.12	30971.74	30355.12	30967.82	323080000	30967.82
##	2022-07-06	30957.30	31224.69	30794.84	31037.68	289800000	31037.68
##	2022-07-07	31190.65	31421.84	31154.64	31384.55	296620000	31384.55
##	2022-07-08	31348.43	31511.46	31212.45	31338.15	238120000	31338.15
##	2022-07-11	31277.98	31367.55	31114.40	31173.84	245020000	31173.84
##	2022-07-12	31113.31	31346.10	30860.51	30981.33	324190000	30981.33
##	2022-07-13	30743.63	30979.17	30514.61	30772.79	291830000	30772.79
##	2022-07-14	30451.80	30680.12	30143.93	30630.17	325130000	30630.17
##	2022-07-15	30775.37	31288.26	30775.37	31288.26	321570000	31288.26
##	2022-07-18	31475.98	31644.68	30982.97	31072.61	309960000	31072.61
##	2022-07-19	31165.91	31842.25	31165.91	31827.05	378720000	31827.05
##	2022-07-20	31829.99	31944.45	31646.95	31874.84	313520000	31874.84
##	2022-07-21	31826.49	32040.63	31534.08	32036.90	302320000	32036.90
##	2022-07-22	32167.92	32219.25	31731.47	31899.29	319880000	31899.29
##	2022-07-25	31950.93	32029.03	31821.67	31990.04	255450000	31990.04
##	2022-07-26	31950.04	31950.04	31705.36	31761.54	324930000	31761.54
##	2022-07-27	31865.05	32336.23	31799.43	32197.59	365480000	32197.59
##	2022-07-28	32197.62	32609.54	31982.61	32529.63	331110000	32529.63
##	2022-07-29	32515.62	32910.18	32493.02	32845.13	487360000	32845.13
##	2022-08-01	32755.71	32972.03	32640.79	32798.40	321180000	32798.40
##	2022-08-02	32691.29	32772.93	32387.12	32396.17	316740000	32396.17
##	2022-08-03	32514.21	32912.74	32514.21	32812.50	342160000	32812.50
##	2022-08-04	32805.69	32829.22	32652.63	32726.82	315590000	32726.82
##	2022-08-05	32593.90	32814.61	32489.62	32803.47	273010000	32803.47
##	2022-08-08	32877.36	33109.96	32769.10	32832.54	275350000	32832.54
##	2022-08-09	32807.36	32877.53	32702.66	32774.41	281080000	32774.41
##	2022-08-10	33130.63	33364.41	33130.63	33309.51	311740000	33309.51
##	2022-08-11	33451.51	33651.80	33289.83	33336.67	308030000	33336.67
##	2022-08-12	33430.72	33767.09	33398.32	33761.05	299140000	33761.05
##	2022-08-15	33710.70	33954.71	33582.96	33912.44	262670000	33912.44
##	2022-08-16	33924.35	34281.36	33852.57	34152.01	288670000	34152.01
##	2022-08-17	34029.55	34161.01	33828.41	33980.32	281390000	33980.32
##	2022-08-18	33981.86	34043.83	33844.46	33999.04	282550000	33999.04

```
## 2022-08-19 33904.69 33904.69 33627.09 33706.74 293990000 33706.74
## 2022-08-22 33586.59 33586.59 33007.63 33063.61 308900000 33063.61
## 2022-08-23 33033.52 33138.26 32858.89 32909.59 251870000 32909.59
## 2022-08-24 32899.01 33095.50 32828.56 32969.23 256900000 32969.23
## 2022-08-25 33029.27 33306.09 32889.85 33291.78 308530000 33291.78
## 2022-08-26 33293.43 33364.70 32278.22 32283.40 352850000 32283.40
## 2022-08-29 32188.00 32325.16 31972.79 32098.99 317820000 32098.99
## 2022-08-30 32163.84 32205.66 31647.22 31790.87 317150000 31790.87
## 2022-08-31 31827.15 31966.04 31509.59 31510.43 392780000 31510.43
```

```
dim(dados.dj)
```

```
## [1] 167 6
```

```
stdpoors <- na.omit(dados.dj)
```

```
View(stdpoors)
```

- Media

```
mean(dados.dj$"Close")
```

```
## Warning in mean.default(dados.dj$Close): argument is not numeric or logical: returning NA
```

```
## [1] NA
```

- Mediana

```
dados.nasdaq <- quantmod::getSymbols("^IXIC", src = "yahoo", from = start, to = end, auto.o
```

```
## Warning: ^IXIC download failed; trying again.
```

```
## Error in getSymbols.yahoo(Symbols = "^IXIC", env = <environment>, verbose = FALSE, : Unab
```

```
## ^IXIC download failed after two attempts. Error message:
```

```
## Could not resolve host: query2.finance.yahoo.com
```

```
dados.nasdaq
```

##	IXIC.Open	IXIC.High	IXIC.Low	IXIC.Close	IXIC.Volume	IXIC.Adjusted
## 2022-01-03	15732.50	15832.80	15644.09	15832.80	4412130000	15832.80
## 2022-01-04	15852.14	15852.14	15512.41	15622.72	5109270000	15622.72
## 2022-01-05	15547.16	15586.30	15095.18	15100.17	5011990000	15100.17
## 2022-01-06	15024.15	15198.45	14914.87	15080.86	4774740000	15080.86
## 2022-01-07	15095.72	15171.02	14877.63	14935.90	4229270000	14935.90
## 2022-01-10	14751.78	14953.85	14530.23	14942.83	5303230000	14942.83
## 2022-01-11	14919.26	15158.71	14837.63	15153.45	4378660000	15153.45
## 2022-01-12	15263.10	15319.03	15117.29	15188.39	4321180000	15188.39
## 2022-01-13	15245.04	15259.71	14782.24	14806.81	4283070000	14806.81
## 2022-01-14	14708.02	14897.68	14689.43	14893.75	4345780000	14893.75
## 2022-01-18	14681.83	14740.54	14482.94	14506.90	5027990000	14506.90
## 2022-01-19	14582.22	14658.89	14331.65	14340.26	4639990000	14340.26
## 2022-01-20	14462.85	14642.03	14140.78	14154.02	5078450000	14154.02
## 2022-01-21	14046.22	14171.72	13764.24	13768.92	5845830000	13768.92

##	2022-01-24	13481.50	13876.61	13094.65	13855.13	6982960000	13855.13
##	2022-01-25	13610.87	13781.62	13414.14	13539.29	4981070000	13539.29
##	2022-01-26	13871.77	14002.65	13392.19	13542.12	5734390000	13542.12
##	2022-01-27	13710.99	13765.91	13322.66	13352.78	5155970000	13352.78
##	2022-01-28	13436.71	13771.91	13236.56	13770.57	4955960000	13770.57
##	2022-01-31	13812.19	14242.90	13767.71	14239.88	5111460000	14239.88
##	2022-02-01	14277.43	14358.69	14070.77	14346.00	4650460000	14346.00
##	2022-02-02	14494.47	14504.82	14264.65	14417.55	4647630000	14417.55
##	2022-02-03	14045.83	14207.89	13851.74	13878.82	4306490000	13878.82
##	2022-02-04	13958.48	14222.76	13850.39	14098.01	4104120000	14098.01
##	2022-02-07	14118.79	14236.31	13974.10	14015.67	4253020000	14015.67
##	2022-02-08	13984.43	14226.48	13934.78	14194.45	4277150000	14194.45
##	2022-02-09	14368.16	14490.72	14330.87	14490.37	4713210000	14490.37
##	2022-02-10	14228.68	14509.56	14118.20	14185.64	5191050000	14185.64
##	2022-02-11	14213.62	14246.70	13733.16	13791.15	5222590000	13791.15
##	2022-02-14	13768.97	13921.71	13664.76	13790.92	4301470000	13790.92
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##	2022-02-28	13570.83	13810.64	13549.90	13751.40	5894130000	13751.40
##	2022-03-01	13716.70	13777.04	13441.32	13532.46	6094490000	13532.46
##	2022-03-02	13597.53	13796.55	13493.91	13752.02	5229480000	13752.02
##	2022-03-03	13837.59	13837.59	13472.64	13537.94	5058590000	13537.94
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##	2022-03-07	13328.36	13353.28	12828.02	12830.96	6163580000	12830.96
##	2022-03-08	12800.04	13159.44	12670.08	12795.55	6631820000	12795.55
##	2022-03-09	13113.70	13301.16	13039.79	13255.55	5377120000	13255.55
##	2022-03-10	13098.35	13163.50	12946.28	13129.96	5034030000	13129.96
##	2022-03-11	13229.77	13239.35	12830.37	12843.81	5250230000	12843.81
##	2022-03-14	12795.12	12918.01	12555.35	12581.22	5853360000	12581.22
##	2022-03-15	12685.23	12973.88	12616.59	12948.62	5414590000	12948.62
##	2022-03-16	13119.37	13440.12	12992.20	13436.55	6498110000	13436.55
##	2022-03-17	13360.72	13620.80	13317.14	13614.78	5575030000	13614.78
##	2022-03-18	13564.63	13899.28	13528.06	13893.84	8109950000	13893.84
##	2022-03-21	13860.39	13945.81	13682.55	13838.46	5636000000	13838.46
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##	2022-03-25	14194.72	14218.76	14010.79	14169.30	5553860000	14169.30
##	2022-03-28	14177.21	14356.00	14101.34	14354.90	5086120000	14354.90
##	2022-03-29	14500.39	14646.90	14419.40	14619.64	6031870000	14619.64

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##	2022-03-31	14444.78	14456.74	14217.72	14220.52	5427030000	14220.52
##	2022-04-01	14269.53	14306.94	14131.81	14261.50	4984050000	14261.50
##	2022-04-04	14304.35	14534.38	14286.45	14532.55	4598480000	14532.55
##	2022-04-05	14490.26	14500.29	14169.12	14204.17	4707090000	14204.17
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##	2022-04-13	13373.12	13679.43	13353.66	13643.59	4887660000	13643.59
##	2022-04-14	13647.43	13662.93	13345.22	13351.08	4623410000	13351.08
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##	2022-04-19	13312.44	13643.97	13281.22	13619.66	4527480000	13619.66
##	2022-04-20	13665.38	13678.55	13426.13	13453.07	4639440000	13453.07
##	2022-04-21	13623.70	13710.70	13140.83	13174.65	5206320000	13174.65
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##	2022-04-25	12749.17	13011.45	12722.59	13004.85	4827790000	13004.85
##	2022-04-26	12918.04	12918.04	12490.74	12490.74	5136770000	12490.74
##	2022-04-27	12500.88	12703.79	12430.90	12488.93	4773290000	12488.93
##	2022-04-28	12712.86	12948.52	12487.86	12871.53	5030570000	12871.53
##	2022-04-29	12710.42	12861.83	12315.74	12334.64	4719290000	12334.64
##	2022-05-02	12331.69	12542.54	12202.41	12536.02	4896740000	12536.02
##	2022-05-03	12511.46	12645.83	12460.99	12563.76	4522940000	12563.76
##	2022-05-04	12574.73	12985.01	12367.02	12964.86	5467750000	12964.86
##	2022-05-05	12787.52	12787.52	12183.56	12317.69	5269260000	12317.69
##	2022-05-06	12246.83	12358.42	11990.15	12144.66	5311020000	12144.66
##	2022-05-09	11923.03	11990.61	11574.94	11623.25	5911380000	11623.25
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##	2022-05-12	11199.25	11547.33	11108.76	11370.96	6647400000	11370.96
##	2022-05-13	11555.97	11856.71	11510.26	11805.00	5868610000	11805.00
##	2022-05-16	11727.14	11804.59	11627.53	11662.79	4898850000	11662.79
##	2022-05-17	11905.57	11988.43	11754.28	11984.52	5068930000	11984.52
##	2022-05-18	11790.68	11826.22	11381.69	11418.15	5043020000	11418.15
##	2022-05-19	11364.40	11562.82	11313.31	11388.50	5136920000	11388.50
##	2022-05-20	11542.67	11552.21	11035.69	11354.62	5413140000	11354.62
##	2022-05-23	11396.28	11552.07	11304.56	11535.27	4509640000	11535.27
##	2022-05-24	11326.44	11351.61	11092.48	11264.45	4706300000	11264.45
##	2022-05-25	11225.03	11511.90	11211.85	11434.74	4500920000	11434.74
##	2022-05-26	11409.84	11796.97	11406.16	11740.65	4651470000	11740.65
##	2022-05-27	11869.69	12131.66	11856.82	12131.13	4774530000	12131.13
##	2022-05-31	12137.54	12190.08	11942.50	12081.39	6028940000	12081.39
##	2022-06-01	12176.89	12237.94	11901.43	11994.46	4697810000	11994.46
##	2022-06-02	11945.57	12320.12	11901.45	12316.90	4422830000	12316.90
##	2022-06-03	12097.12	12167.44	11966.62	12012.73	4117290000	12012.73

##	2022-06-06	12200.33	12245.40	12004.20	12061.37	4633950000	12061.37
##	2022-06-07	11925.81	12194.86	11888.61	12175.23	4383960000	12175.23
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##	2022-06-09	12016.47	12115.06	11751.98	11754.23	5382110000	11754.23
##	2022-06-10	11543.88	11569.15	11328.27	11340.02	5125980000	11340.02
##	2022-06-13	10986.85	11071.48	10775.14	10809.23	5912360000	10809.23
##	2022-06-14	10897.43	10926.81	10733.04	10828.35	4802090000	10828.35
##	2022-06-15	10968.40	11244.26	10866.39	11099.15	5346110000	11099.15
##	2022-06-16	10806.02	10831.07	10565.14	10646.10	5667810000	10646.10
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##	2022-07-05	10964.18	11323.89	10911.45	11322.24	5028520000	11322.24
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##	2022-07-11	11524.49	11541.10	11348.06	11372.60	4343130000	11372.60
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##	2022-07-14	11151.21	11279.97	11005.93	11251.19	4456350000	11251.19
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##	2022-07-18	11561.64	11629.03	11322.84	11360.05	5003870000	11360.05
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##	2022-07-20	11726.09	11939.96	11703.36	11897.65	5427450000	11897.65
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##	2022-07-22	12025.37	12093.02	11767.19	11834.11	4700220000	11834.11
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##	2022-07-28	12036.48	12179.09	11886.67	12162.59	4892770000	12162.59
##	2022-07-29	12239.69	12426.26	12181.13	12390.69	4893090000	12390.69
##	2022-08-01	12317.96	12499.72	12271.98	12368.98	4373610000	12368.98
##	2022-08-02	12287.67	12503.34	12260.48	12348.76	4742630000	12348.76
##	2022-08-03	12433.87	12699.64	12425.21	12668.16	5628590000	12668.16
##	2022-08-04	12675.04	12736.19	12600.78	12720.58	5408540000	12720.58
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##	2022-08-10	12793.44	12861.44	12698.61	12854.80	5135480000	12854.80



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## 2022-08-11 12944.82 13026.24 12760.09 12779.91 5785100000 12779.91
## 2022-08-12 12866.31 13047.19 12821.22 13047.19 4755980000 13047.19
## 2022-08-15 12996.63 13146.06 12993.78 13128.05 4445180000 13128.05
## 2022-08-16 13082.64 13181.09 12979.24 13102.55 4992400000 13102.55
## 2022-08-17 12968.63 13053.51 12863.01 12938.12 5166110000 12938.12
## 2022-08-18 12937.79 13002.66 12873.49 12965.34 4663920000 12965.34
## 2022-08-19 12832.27 12859.01 12674.87 12705.22 4591500000 12705.22
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## 2022-08-25 12506.37 12641.26 12471.98 12639.27 4290090000 12639.27
## 2022-08-26 12630.58 12655.84 12141.52 12141.71 4510480000 12141.71
## 2022-08-29 12021.05 12124.87 11981.42 12017.67 4183740000 12017.67
## 2022-08-30 12093.06 12101.85 11790.02 11883.14 4630720000 11883.14
## 2022-08-31 11972.56 12027.43 11814.17 11816.20 4911500000 11816.20

dim(dados.nasdaq)

## [1] 167 6

nasdaq <- na.omit(dados.nasdaq)
View(nasdaq)

dados.bovespa <- quantmod::getSymbols("~BVSP", src = "yahoo", from = start, to = end, auto
## Warning: ~BVSP download failed; trying again.

## Error in getSymbols.yahoo(Symbols = "~BVSP", env = <environment>, verbose = FALSE, : Unab
## ~BVSP download failed after two attempts. Error message:
## Could not resolve host: query2.finance.yahoo.com

dados.bovespa

##          BVSP.Open BVSP.High BVSP.Low BVSP.Close BVSP.Volume BVSP.Adjusted
## 2022-01-03    104823    106125    103413    103922    11128500    103922
## 2022-01-04    103922    104276    103096    103514    11491600    103514
## 2022-01-05    103514    103514    100850    101006         0    101006
## 2022-01-06    101006    102235    101000    101561    11749200    101561
## 2022-01-07    101561    102719    101104    102719    11733200    102719
## 2022-01-10    102719    102719    101038    101945    10264700    101945
## 2022-01-11    101946    103780    101918    103779    12421500    103779
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## 2022-01-13    105686    106251    104974    105530    11712300    105530
## 2022-01-14    105530    107062    105028    106928    11457100    106928
## 2022-01-17    106927    106928    106097    106692     6924200    106692
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## 2022-01-19    106670    108602    106669    108013    12595600    108013
## 2022-01-20    108015    109873    108015    109102    13630500    109102
## 2022-01-21    109097    109786    108368    108942    13408400    108942
## 2022-01-24    108941    108948    106624    107752    12700800    107752

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## 2022-01-31	111910	112495	111195	112388	12190800	112388
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## 2022-02-02	113228	113666	111645	112161	11751200	112161
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## 2022-02-04	111696	112415	110321	112245	0	112245
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## 2022-04-01	120001	121579	120001	121570	13780900	121570
## 2022-04-04	121569	121570	120754	121280	8812500	121280
## 2022-04-05	121279	121628	118794	118885	11788300	118885
## 2022-04-06	118885	118885	116791	118228	13410800	118228
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## 2022-04-14	116781	116781	115624	116182	10365400	116182
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## 2022-04-26	110684	110685	107978	108213	11747500	108213
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## 2022-04-29	109922	111819	107876	107876	13662200	107876
## 2022-05-02	107876	107884	105218	106639	11935100	106639
## 2022-05-03	106640	107127	106033	106528	9935500	106528
## 2022-05-04	106529	108382	104933	108344	14558600	108344
## 2022-05-05	108337	108337	103923	105304	13826200	105304
## 2022-05-06	105303	106268	103984	105135	14137700	105135
## 2022-05-09	105109	105109	102768	103250	13196700	103250
## 2022-05-10	103251	104286	102386	103110	13507400	103110
## 2022-05-11	103110	105374	103008	104397	13425100	104397
## 2022-05-12	104395	105708	103579	105688	13995600	105688
## 2022-05-13	105691	107773	105691	106924	12369300	106924
## 2022-05-16	108685	108685	108199	108233	10596900	108233
## 2022-05-17	108246	109774	108245	108789	16503400	108789
## 2022-05-18	107903	108096	106038	106247	14752800	106247
## 2022-05-19	106249	107420	105760	107005	11426400	107005
## 2022-05-20	108520	108795	107351	108488	12866400	108488
## 2022-05-23	108500	110680	108500	110346	10682700	110346
## 2022-05-24	110340	110635	108399	110581	11724400	110581
## 2022-05-25	110085	111006	109699	110580	10737700	110580
## 2022-05-26	110577	112102	110388	111890	13077400	111890
## 2022-05-27	111890	112441	111558	111942	9979300	111942
## 2022-05-30	111944	112690	110655	111032	7284500	111032
## 2022-05-31	111036	111903	110685	111351	15809400	111351
## 2022-06-01	111351	111931	110822	111360	9790200	111360
## 2022-06-02	111363	112709	111218	112393	10051100	112393
## 2022-06-03	112392	112392	110935	111102	8757500	111102
## 2022-06-06	111102	111935	110015	110186	8212400	110186
## 2022-06-07	110185	110435	109394	110070	9466200	110070

## 2022-06-08	110067	110142	108045	108368	10379900	108368
## 2022-06-09	108367	108510	107068	107094	11955500	107094
## 2022-06-10	107091	107092	104648	105481	12840500	105481
## 2022-06-13	105476	105478	101700	102598	13837900	102598
## 2022-06-14	102598	103328	101325	102063	11563200	102063
## 2022-06-15	102068	103952	102046	102807	16023500	102807
## 2022-06-17	102800	102801	98402	99825	18927300	99825
## 2022-06-20	99824	100481	98409	99853	10900800	99853
## 2022-06-21	99854	101069	99167	99685	11072300	99685
## 2022-06-22	99678	100374	98050	99522	11675100	99522
## 2022-06-23	99523	100232	97775	98080	12397700	98080
## 2022-06-24	98081	99313	98031	98672	10345200	98672
## 2022-06-27	98673	101106	98672	100764	9895900	100764
## 2022-06-28	100766	102237	99956	100591	10493900	100591
## 2022-06-29	100592	101313	99218	99622	10448100	99622
## 2022-06-30	99619	99619	97758	98542	14588800	98542
## 2022-07-01	98542	99340	97231	98954	11609800	98954
## 2022-07-04	98952	99353	98264	98609	6279300	98609
## 2022-07-05	98608	98608	96499	98295	13358800	98295
## 2022-07-06	98294	99141	97423	98719	13348200	98719
## 2022-07-07	98722	101420	98722	100730	12696300	100730
## 2022-07-08	100732	101577	99958	100289	9730400	100289
## 2022-07-11	100282	100282	97854	98212	8893400	98212
## 2022-07-12	98212	98737	97253	98271	12566300	98271
## 2022-07-13	98258	98928	97403	97881	12208100	97881
## 2022-07-14	97879	97879	95431	96121	12579000	96121
## 2022-07-15	96119	96971	95267	96551	11347600	96551
## 2022-07-18	96553	98291	96553	96916	10738200	96916
## 2022-07-19	96920	98346	96917	98245	10295900	98245
## 2022-07-20	98244	98366	97277	98287	12941700	98287
## 2022-07-21	98286	99057	97088	99033	10060000	99033
## 2022-07-22	99034	99724	98321	98925	10033500	98925
## 2022-07-25	98926	100508	98925	100270	8621800	100270
## 2022-07-26	100270	100753	99365	99772	9136600	99772
## 2022-07-27	99773	101471	99772	101438	10263100	101438
## 2022-07-28	101437	102686	101045	102597	11130000	102597
## 2022-07-29	102597	103989	102514	103165	12934200	103165
## 2022-08-01	103165	103317	101764	102225	11626700	102225
## 2022-08-02	102225	103660	101694	103362	10124500	103362
## 2022-08-03	103362	103878	102822	103775	12379600	103775
## 2022-08-04	103777	106162	103777	105892	15499000	105892
## 2022-08-05	105893	107176	105518	106472	12947500	106472
## 2022-08-08	106473	108489	106473	108402	12674600	108402
## 2022-08-09	108403	109331	107842	108651	12147900	108651
## 2022-08-10	108658	110362	108657	110236	13376200	110236
## 2022-08-11	110236	111310	109604	109718	14944800	109718

```

## 2022-08-12    109718    112764    109718    112764    18704900    112764
## 2022-08-15    112767    113214    111067    113032    15552900    113032
## 2022-08-16    113034    113626    112690    113512    12986400    113512
## 2022-08-17    113508    114146    112483    113708    14652800    113708
## 2022-08-18    113708    114375    113304    113813    10644200    113813
## 2022-08-19    113807    113807    111146    111496    12678600    111496
## 2022-08-22    111487    111487    109858    110501    11010900    110501
## 2022-08-23    110504    112965    110503    112857    11892000    112857
## 2022-08-24    112856    113888    112632    112898    13758600    112898
## 2022-08-25    112898    114156    112768    113532    11838500    113532
## 2022-08-26    113533    114091    111978    112299    11159700    112299
## 2022-08-29    112296    113222    111689    112323    9795800    112323
## 2022-08-30    112323    112869    110103    110431    11937900    110431
## 2022-08-31    110431    111364    109523    109523    14791100    109523

dim(dados.bovespa)

## [1] 168    6

bovespa <- na.omit(dados.bovespa)
View(bovespa)

dados.brent <- quantmod::getSymbols("BZ=F", src = "yahoo", from = start, to = end, auto.as

## Warning: BZ=F download failed; trying again.

## Error in getSymbols.yahoo(Symbols = "BZ=F", env = <environment>, verbose = FALSE, : Unabl
## BZ=F download failed after two attempts. Error message:
## Could not resolve host: query2.finance.yahoo.com

dados.brent

##          BZ=F.Open BZ=F.High BZ=F.Low BZ=F.Close BZ=F.Volume BZ=F.Adjusted
## 2022-01-03      77.94      79.28      77.04      78.98      27224      78.98
## 2022-01-04      78.95      80.55      78.60      80.00      31321      80.00
## 2022-01-05      80.08      81.49      79.55      80.80      35152      80.80
## 2022-01-06      80.15      82.84      79.63      81.99      41582      81.99
## 2022-01-07      82.06      82.99      81.44      81.75      29501      81.75
## 2022-01-10      81.79      82.27      80.49      80.87      30035      80.87
## 2022-01-11      80.96      83.97      80.88      83.72      37934      83.72
## 2022-01-12      83.69      85.20      83.51      84.67      32298      84.67
## 2022-01-13      84.78      85.09      83.79      84.47      27107      84.47
## 2022-01-14      84.13      86.50      84.03      86.06      31970      86.06
## 2022-01-18      86.50      88.55      85.55      87.51      45875      87.51
## 2022-01-19      88.45      89.17      87.63      88.44      37483      88.44
## 2022-01-20      87.73      89.51      87.03      88.38      30524      88.38
## 2022-01-21      87.35      88.22      85.71      87.89      29566      87.89
## 2022-01-24      87.65      88.88      85.02      86.27      34253      86.27
## 2022-01-25      87.17      88.36      86.19      88.20      29496      88.20
## 2022-01-26      88.02      90.48      87.80      89.96      29805      89.96

```

## 2022-01-27	89.78	91.04	88.98	89.34	15201	89.34
## 2022-01-28	89.89	91.69	89.41	90.03	10824	90.03
## 2022-01-31	90.80	91.30	90.75	91.21	118	91.21
## 2022-02-01	91.29	91.29	91.29	91.29	36248	91.29
## 2022-02-02	89.29	90.51	88.28	89.47	38172	89.47
## 2022-02-03	89.06	91.29	88.01	91.11	33059	91.11
## 2022-02-04	91.04	93.70	90.89	93.27	33357	93.27
## 2022-02-07	92.73	93.99	92.15	92.69	37016	92.69
## 2022-02-08	93.01	93.01	89.93	90.78	39288	90.78
## 2022-02-09	91.27	92.06	90.06	91.55	34759	91.55
## 2022-02-10	91.72	93.09	90.90	91.41	43235	91.41
## 2022-02-11	91.26	95.64	90.52	94.44	53045	94.44
## 2022-02-14	95.31	96.78	93.46	96.48	48449	96.48
## 2022-02-15	95.76	96.24	92.06	93.28	45181	93.28
## 2022-02-16	93.59	96.07	91.14	94.81	45148	94.81
## 2022-02-17	92.09	94.51	91.82	92.97	38045	92.97
## 2022-02-18	92.98	94.15	90.26	93.54	42436	93.54
## 2022-02-22	94.28	99.44	92.56	96.84	59945	96.84
## 2022-02-23	96.63	98.70	95.80	96.84	33549	96.84
## 2022-02-24	97.56	105.75	97.49	99.08	21282	99.08
## 2022-02-25	99.65	101.99	96.00	97.93	7025	97.93
## 2022-02-28	100.48	104.48	99.90	100.99	448	100.99
## 2022-03-01	100.85	100.85	100.85	100.85	56428	100.85
## 2022-03-02	107.54	115.05	106.49	112.93	59273	112.93
## 2022-03-03	114.25	119.77	109.42	110.46	37420	110.46
## 2022-03-04	110.58	118.97	109.61	118.11	34984	118.11
## 2022-03-07	121.24	137.00	119.07	123.21	29504	123.21
## 2022-03-08	124.25	133.13	121.37	127.98	38358	127.98
## 2022-03-09	129.57	131.63	108.00	111.14	42740	111.14
## 2022-03-10	112.74	118.33	108.95	109.33	30414	109.33
## 2022-03-11	109.72	113.88	107.13	112.67	18819	112.67
## 2022-03-14	112.90	113.04	103.45	106.90	19364	106.90
## 2022-03-15	106.00	106.46	97.50	99.91	26067	99.91
## 2022-03-16	99.04	103.68	96.95	98.02	18514	98.02
## 2022-03-17	98.10	107.57	97.88	106.64	15091	106.64
## 2022-03-18	107.24	109.57	105.80	107.93	10489	107.93
## 2022-03-21	107.37	116.73	107.09	115.62	11620	115.62
## 2022-03-22	116.85	119.42	112.77	115.48	14222	115.48
## 2022-03-23	114.74	122.29	114.42	121.60	14286	121.60
## 2022-03-24	121.27	123.70	116.95	119.03	12778	119.03
## 2022-03-25	118.28	120.87	115.21	120.65	14026	120.65
## 2022-03-28	120.31	120.31	109.06	112.48	15212	112.48
## 2022-03-29	109.73	114.71	104.98	110.23	7152	110.23
## 2022-03-30	111.00	114.65	110.90	113.45	4472	113.45
## 2022-03-31	108.71	109.36	107.37	107.91	31	107.91
## 2022-04-01	107.67	107.67	107.67	107.67	17144	107.67

## 2022-04-04	104.25	108.55	102.91	107.53	18406	107.53
## 2022-04-05	108.24	109.85	104.56	106.64	15613	106.64
## 2022-04-06	105.79	108.66	100.54	101.07	20212	101.07
## 2022-04-07	102.15	103.50	98.45	100.58	19577	100.58
## 2022-04-08	101.69	103.25	99.71	102.78	16735	102.78
## 2022-04-11	103.07	103.09	97.62	98.48	23852	98.48
## 2022-04-12	99.25	105.60	98.98	104.64	22697	104.64
## 2022-04-13	104.98	109.00	104.07	108.78	22260	108.78
## 2022-04-14	108.37	112.39	106.64	111.70	17418	111.70
## 2022-04-18	111.89	114.82	110.72	113.16	13187	113.16
## 2022-04-19	112.65	114.05	106.77	107.25	18972	107.25
## 2022-04-20	107.72	108.98	104.67	106.80	15985	106.80
## 2022-04-21	107.01	109.79	106.78	108.33	13203	108.33
## 2022-04-22	108.64	108.73	105.53	106.65	11040	106.65
## 2022-04-25	105.74	105.95	99.47	102.32	15464	102.32
## 2022-04-26	102.57	106.15	101.12	104.99	13279	104.99
## 2022-04-27	105.37	106.35	103.27	105.32	8064	105.32
## 2022-04-28	104.76	107.93	103.30	107.59	8567	107.59
## 2022-04-29	107.65	109.77	107.65	109.34	55	109.34
## 2022-05-02	109.36	109.36	109.36	109.36	23606	109.36
## 2022-05-03	107.37	108.30	104.62	104.97	23410	104.97
## 2022-05-04	106.10	111.00	105.50	110.14	21158	110.14
## 2022-05-05	110.14	113.99	109.23	110.90	26443	110.90
## 2022-05-06	111.15	113.52	109.88	112.39	23902	112.39
## 2022-05-09	113.05	113.22	104.95	105.94	28134	105.94
## 2022-05-10	105.56	106.91	101.70	102.46	25904	102.46
## 2022-05-11	101.70	108.26	100.93	107.51	31560	107.51
## 2022-05-12	107.56	108.69	104.69	107.45	27037	107.45
## 2022-05-13	108.00	111.69	107.81	111.55	25050	111.55
## 2022-05-16	111.41	114.78	109.04	114.24	20871	114.24
## 2022-05-17	114.29	115.66	111.12	111.93	23254	111.93
## 2022-05-18	112.89	114.13	108.35	109.11	21217	109.11
## 2022-05-19	109.30	112.27	105.70	112.04	26098	112.04
## 2022-05-20	111.50	113.22	110.54	112.55	16942	112.55
## 2022-05-23	112.74	114.36	111.86	113.42	20660	113.42
## 2022-05-24	113.36	114.63	111.72	113.56	20941	113.56
## 2022-05-25	113.92	115.32	113.04	114.03	12885	114.03
## 2022-05-26	114.45	118.00	113.84	117.40	11590	117.40
## 2022-05-27	117.54	119.73	116.68	119.43	4384	119.43
## 2022-05-30	NA	NA	NA	NA	NA	NA
## 2022-05-31	119.47	124.13	119.36	122.84	1138	122.84
## 2022-06-01	116.63	118.58	115.43	116.29	21546	116.29
## 2022-06-02	115.82	118.44	112.48	117.61	22117	117.61
## 2022-06-03	118.26	121.44	116.08	119.72	11028	119.72
## 2022-06-06	121.35	121.89	118.76	119.51	16523	119.51
## 2022-06-07	120.08	121.38	118.56	120.57	20488	120.57

## 2022-06-08	121.03	124.41	120.46	123.58	21778	123.58
## 2022-06-09	123.89	124.33	122.50	123.07	21008	123.07
## 2022-06-10	122.94	124.33	119.87	122.01	26036	122.01
## 2022-06-13	121.69	123.61	118.95	122.27	21136	122.27
## 2022-06-14	122.50	125.18	118.94	121.17	27702	121.17
## 2022-06-15	121.00	121.85	117.75	118.51	22360	118.51
## 2022-06-16	119.12	120.28	115.58	119.81	24329	119.81
## 2022-06-17	119.34	121.25	111.72	113.12	26686	113.12
## 2022-06-20	113.80	114.46	111.57	114.20	26686	114.20
## 2022-06-21	113.80	116.25	111.57	114.65	22868	114.65
## 2022-06-22	114.57	114.57	107.03	111.74	33112	111.74
## 2022-06-23	110.22	112.69	108.11	110.05	21806	110.05
## 2022-06-24	109.81	113.99	109.27	113.12	13431	113.12
## 2022-06-27	112.46	116.04	111.25	115.09	11252	115.09
## 2022-06-28	115.84	118.24	115.40	117.98	6673	117.98
## 2022-06-29	117.96	120.38	115.41	116.26	4346	116.26
## 2022-06-30	116.04	116.33	114.81	114.81	24733	114.81
## 2022-07-01	109.46	112.42	108.01	111.63	17090	111.63
## 2022-07-04	NA	NA	NA	NA	NA	NA
## 2022-07-05	111.61	114.69	101.11	102.77	43356	102.77
## 2022-07-06	104.00	105.80	98.51	100.69	28820	100.69
## 2022-07-07	99.96	106.35	98.47	104.65	22837	104.65
## 2022-07-08	104.49	107.45	103.75	107.02	20610	107.02
## 2022-07-11	106.76	107.66	103.66	107.10	17691	107.10
## 2022-07-12	106.23	106.51	98.91	99.49	22827	99.49
## 2022-07-13	99.31	101.20	97.30	99.57	22358	99.57
## 2022-07-14	99.85	100.37	94.50	99.10	27515	99.10
## 2022-07-15	99.60	102.62	98.21	101.16	19146	101.16
## 2022-07-18	100.92	106.47	99.48	106.27	20217	106.27
## 2022-07-19	105.59	107.60	103.59	107.35	21900	107.35
## 2022-07-20	107.15	107.43	105.09	106.92	23989	106.92
## 2022-07-21	106.79	106.80	101.52	103.86	26598	103.86
## 2022-07-22	104.25	105.68	101.91	103.20	17586	103.20
## 2022-07-25	103.44	105.35	101.67	105.15	14999	105.15
## 2022-07-26	104.81	107.35	103.98	104.40	20242	104.40
## 2022-07-27	104.78	107.80	103.72	106.62	11024	106.62
## 2022-07-28	107.49	108.98	105.96	107.14	6831	107.14
## 2022-07-29	108.05	110.43	108.03	110.01	24476	110.01
## 2022-08-01	103.87	104.37	99.10	100.03	25670	100.03
## 2022-08-02	100.00	102.41	98.47	100.54	17357	100.54
## 2022-08-03	99.64	102.37	96.48	96.78	22263	96.78
## 2022-08-04	97.01	97.63	93.15	94.12	21011	94.12
## 2022-08-05	93.59	96.40	92.75	94.92	16576	94.92
## 2022-08-08	94.27	96.73	92.99	96.65	17288	96.65
## 2022-08-09	96.54	98.39	94.91	96.31	20553	96.31
## 2022-08-10	96.46	97.98	93.61	97.40	29520	97.40



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## 2022-08-11    97.27    100.16    96.65    99.60    20958    99.60
## 2022-08-12    99.29    100.35    96.94    98.15    20095    98.15
## 2022-08-15    97.76    98.04    92.72    95.10    20714    95.10
## 2022-08-16    93.64    95.95    91.72    92.34    22549    92.34
## 2022-08-17    92.77    94.46    91.52    93.65    21011    93.65
## 2022-08-18    93.18    97.41    93.05    96.59    21327    96.59
## 2022-08-19    96.63    97.87    94.25    96.72    22212    96.72
## 2022-08-22    95.66    97.25    92.36    96.48    26974    96.48
## 2022-08-23    96.58    100.45    96.51    100.22    22624    100.22
## 2022-08-24    100.16    102.00    99.07    101.22    24490    101.22
## 2022-08-25    101.60    102.47    99.12    99.34    20704    99.34
## 2022-08-26    99.88    101.17    98.14    100.99    14241    100.99
## 2022-08-29    100.83    105.48    100.29    105.09    6048    105.09
## 2022-08-30    105.00    105.37    97.67    99.31    7116    99.31
## 2022-08-31    99.71    100.30    95.76    96.49    24672    96.49

dim(dados.brent)
## [1] 170    6

brent <- na.omit(dados.brent)
View(brent)

dados.dolar.real <- quantmod::getSymbols("BRL=X", src = "yahoo", from = start, to = end, a

## Warning: BRL=X download failed; trying again.

## Error in getSymbols.yahoo(Symbols = "BRL=X", env = <environment>, verbose = FALSE, : Unabl
## BRL=X download failed after two attempts. Error message:
## Could not resolve host: query2.finance.yahoo.com

dados.dolar.real

##          BRL=X.Open BRL=X.High BRL=X.Low BRL=X.Close BRL=X.Volume BRL=X.Adjusted
## 2022-01-03    5.460600    5.670700    5.460600    5.569300          0    5.569300
## 2022-01-04    5.680900    5.707600    5.638900    5.681200          0    5.681200
## 2022-01-05    5.676000    5.691600    5.641800    5.676200          0    5.676200
## 2022-01-06    5.707700    5.721800    5.682800    5.705635          0    5.705635
## 2022-01-07    5.680289    5.706900    5.619900    5.682400          0    5.682400
## 2022-01-10    5.632000    5.689500    5.624600    5.632200          0    5.632200
## 2022-01-11    5.662100    5.673000    5.581573    5.662200          0    5.662200
## 2022-01-12    5.568400    5.598800    5.545577    5.567300          0    5.567300
## 2022-01-13    5.533100    5.558000    5.497654    5.533200          0    5.533200
## 2022-01-14    5.527500    5.550500    5.523507    5.526700          0    5.526700
## 2022-01-17    5.531900    5.534100    5.493700    5.533300          0    5.533300
## 2022-01-18    5.515800    5.546500    5.504800    5.515800          0    5.515800
## 2022-01-19    5.565500    5.566300    5.459912    5.565700          0    5.565700
## 2022-01-20    5.437200    5.456800    5.399700    5.437200          0    5.437200
## 2022-01-21    5.415809    5.473500    5.404100    5.418100          0    5.418100
## 2022-01-24    5.455800    5.517100    5.448961    5.457100          0    5.457100

```

##	2022-01-25	5.486100	5.517700	5.465400	5.486100	0	5.486100
##	2022-01-26	5.440295	5.454000	5.412000	5.440704	0	5.440704
##	2022-01-27	5.429167	5.432100	5.352800	5.429167	0	5.429167
##	2022-01-28	5.403456	5.424200	5.375200	5.403485	0	5.403485
##	2022-01-31	5.365500	5.395800	5.282676	5.362600	0	5.362600
##	2022-02-01	5.303100	5.313705	5.271400	5.303100	0	5.303100
##	2022-02-02	5.264700	5.311900	5.255267	5.264500	0	5.264500
##	2022-02-03	5.261500	5.319600	5.258240	5.260900	0	5.260900
##	2022-02-04	5.282800	5.348600	5.277500	5.282900	0	5.282900
##	2022-02-07	5.326200	5.343000	5.276800	5.326900	0	5.326900
##	2022-02-08	5.262800	5.284900	5.251000	5.262600	0	5.262600
##	2022-02-09	5.256489	5.288000	5.232774	5.258400	0	5.258400
##	2022-02-10	5.231429	5.244600	5.170000	5.234500	0	5.234500
##	2022-02-11	5.248600	5.251200	5.182800	5.248700	0	5.248700
##	2022-02-14	5.250500	5.263300	5.195300	5.249956	0	5.249956
##	2022-02-15	5.213700	5.219900	5.166288	5.214000	0	5.214000
##	2022-02-16	5.158000	5.184725	5.143800	5.157900	0	5.157900
##	2022-02-17	5.133567	5.180000	5.121471	5.135800	0	5.135800
##	2022-02-18	5.168756	5.175100	5.116900	5.170600	0	5.170600
##	2022-02-21	5.136400	5.149900	5.074800	5.137500	0	5.137500
##	2022-02-22	5.102300	5.106600	5.046696	5.102700	0	5.102700
##	2022-02-23	5.057200	5.060600	4.996500	5.057100	0	5.057100
##	2022-02-24	5.006725	5.146600	5.000000	5.008700	0	5.008700
##	2022-02-25	5.120520	5.166200	5.076349	5.122200	0	5.122200
##	2022-02-28	5.166000	5.166500	5.151300	5.159400	0	5.159400
##	2022-03-01	5.158900	5.159900	5.154538	5.158400	0	5.158400
##	2022-03-02	5.159900	5.212400	5.146400	5.159000	0	5.159000
##	2022-03-03	5.098700	5.107600	5.018600	5.096503	0	5.096503
##	2022-03-04	5.031000	5.097900	5.026275	5.030900	0	5.030900
##	2022-03-07	5.058900	5.088916	5.026200	5.060560	0	5.060560
##	2022-03-08	5.110100	5.111830	5.060375	5.110500	0	5.110500
##	2022-03-09	5.059000	5.060000	4.983800	5.058800	0	5.058800
##	2022-03-10	5.011100	5.073300	5.000905	5.011500	0	5.011500
##	2022-03-11	5.010200	5.053000	4.983300	5.009700	0	5.009700
##	2022-03-14	5.073100	5.083800	5.037000	5.073500	0	5.073500
##	2022-03-15	5.121700	5.149500	5.089902	5.121400	0	5.121400
##	2022-03-16	5.163200	5.163700	5.095000	5.163200	0	5.163200
##	2022-03-17	5.076000	5.104300	5.040100	5.073875	0	5.073875
##	2022-03-18	5.036666	5.071900	5.008420	5.039400	0	5.039400
##	2022-03-21	5.017800	5.025100	4.928282	5.017800	0	5.017800
##	2022-03-22	4.933000	4.948900	4.903000	4.935200	0	4.935200
##	2022-03-23	4.910000	4.912000	4.843000	4.910000	0	4.910000
##	2022-03-24	4.824200	4.837570	4.763647	4.824200	0	4.824200
##	2022-03-25	4.826100	4.828500	4.746200	4.826300	0	4.826300
##	2022-03-28	4.736900	4.815800	4.730483	4.736900	0	4.736900
##	2022-03-29	4.764100	4.771100	4.714928	4.764100	0	4.764100

##	2022-03-30	4.756200	4.786300	4.726700	4.756200	0	4.756200
##	2022-03-31	4.769700	4.790800	4.723229	4.769700	0	4.769700
##	2022-04-01	4.737800	4.739600	4.689045	4.737800	0	4.737800
##	2022-04-04	4.657200	4.670100	4.604057	4.657200	0	4.657200
##	2022-04-05	4.593800	4.669100	4.575500	4.593800	0	4.593800
##	2022-04-06	4.650700	4.712600	4.647900	4.650700	0	4.650700
##	2022-04-07	4.715200	4.769900	4.690400	4.715200	0	4.715200
##	2022-04-08	4.752100	4.791300	4.707518	4.752100	0	4.752100
##	2022-04-11	4.698000	4.732600	4.684016	4.698100	0	4.698100
##	2022-04-12	4.693600	4.697100	4.621500	4.693600	0	4.693600
##	2022-04-13	4.673100	4.702300	4.653200	4.673100	0	4.673100
##	2022-04-14	4.690200	4.738100	4.669788	4.690200	0	4.690200
##	2022-04-15	4.701000	4.710000	4.696500	4.701000	0	4.701000
##	2022-04-18	4.700600	4.704900	4.659300	4.700600	0	4.700600
##	2022-04-19	4.652000	4.683800	4.637000	4.652000	0	4.652000
##	2022-04-20	4.665000	4.676700	4.609000	4.665000	0	4.665000
##	2022-04-21	4.620800	4.621600	4.606555	4.620800	0	4.620800
##	2022-04-22	4.620800	4.770700	4.617611	4.620800	0	4.620800
##	2022-04-25	4.795200	4.943000	4.790587	4.795200	0	4.795200
##	2022-04-26	4.876200	4.995800	4.873625	4.876200	0	4.876200
##	2022-04-27	4.997800	5.036400	4.977440	4.997800	0	4.997800
##	2022-04-28	4.963600	5.040900	4.960196	4.963600	0	4.963600
##	2022-04-29	4.937800	4.954800	4.858228	4.937800	0	4.937800
##	2022-05-02	4.971300	5.040200	4.967100	4.971300	0	4.971300
##	2022-05-03	5.084700	5.085800	4.992600	5.084700	0	5.084700
##	2022-05-04	4.958100	5.028500	4.954729	4.958100	0	4.958100
##	2022-05-05	4.918800	5.052800	4.903801	4.918800	0	4.918800
##	2022-05-06	5.028000	5.111400	5.009100	5.028000	0	5.028000
##	2022-05-09	5.080400	5.148389	5.074281	5.080400	0	5.080400
##	2022-05-10	5.160900	5.162200	5.111000	5.160900	0	5.160900
##	2022-05-11	5.131300	5.165100	5.091936	5.131300	0	5.131300
##	2022-05-12	5.134252	5.207500	5.106800	5.134252	0	5.134252
##	2022-05-13	5.133400	5.145900	5.068500	5.133400	0	5.133400
##	2022-05-16	5.058300	5.101700	5.031900	5.058300	0	5.058300
##	2022-05-17	5.059700	5.060600	4.949100	5.059700	0	5.059700
##	2022-05-18	4.938100	4.978100	4.915875	4.938100	0	4.938100
##	2022-05-19	4.967500	4.970300	4.893300	4.967500	0	4.967500
##	2022-05-20	4.930000	4.931200	4.852000	4.930000	0	4.930000
##	2022-05-23	4.880200	4.880200	4.789300	4.880200	0	4.880200
##	2022-05-24	4.813500	4.851000	4.774023	4.813500	0	4.813500
##	2022-05-25	4.817800	4.858800	4.814712	4.817800	0	4.817800
##	2022-05-26	4.822800	4.840900	4.776500	4.822800	0	4.822800
##	2022-05-27	4.768200	4.777900	4.713917	4.768200	0	4.768200
##	2022-05-30	4.729600	4.741600	4.690600	4.729600	0	4.729600
##	2022-05-31	4.752400	4.774024	4.696900	4.752400	0	4.752400
##	2022-06-01	4.730400	4.806800	4.721500	4.730400	0	4.730400

##	2022-06-02	4.815500	4.816600	4.773600	4.815500	0	4.815500
##	2022-06-03	4.795700	4.828400	4.765131	4.795700	0	4.795700
##	2022-06-06	4.775000	4.802700	4.745628	4.775000	0	4.775000
##	2022-06-07	4.794200	4.926400	4.789800	4.794200	0	4.794200
##	2022-06-08	4.867526	4.904300	4.842500	4.867526	0	4.867526
##	2022-06-09	4.898100	4.915600	4.865091	4.898100	0	4.898100
##	2022-06-10	4.903300	5.008600	4.883527	4.903300	0	4.903300
##	2022-06-13	4.984000	5.134800	4.983900	4.984000	0	4.984000
##	2022-06-14	5.113400	5.134300	5.083500	5.113400	0	5.113400
##	2022-06-15	5.116100	5.131100	5.082382	5.116100	0	5.116100
##	2022-06-16	5.052000	5.053900	5.046274	5.052000	0	5.052000
##	2022-06-17	5.052200	5.146500	5.049120	5.052200	0	5.052200
##	2022-06-20	5.152100	5.186600	5.135865	5.152100	0	5.152100
##	2022-06-21	5.187200	5.189000	5.117500	5.187200	0	5.187200
##	2022-06-22	5.122800	5.178600	5.120937	5.122800	0	5.122800
##	2022-06-23	5.193600	5.212000	5.165558	5.193600	0	5.193600
##	2022-06-24	5.238000	5.273400	5.202000	5.238000	0	5.238000
##	2022-06-27	5.241400	5.273200	5.200900	5.241400	0	5.241400
##	2022-06-28	5.236800	5.260100	5.186483	5.236800	0	5.236800
##	2022-06-29	5.266600	5.272400	5.208400	5.266600	0	5.266600
##	2022-06-30	5.180900	5.268800	5.177619	5.180900	0	5.180900
##	2022-07-01	5.252000	5.335400	5.249412	5.252000	0	5.252000
##	2022-07-04	5.331000	5.331400	5.287100	5.331000	0	5.331000
##	2022-07-05	5.328300	5.401300	5.304464	5.328300	0	5.328300
##	2022-07-06	5.385200	5.459700	5.381861	5.385200	0	5.385200
##	2022-07-07	5.428000	5.429500	5.329027	5.428000	0	5.428000
##	2022-07-08	5.338200	5.363200	5.277800	5.338200	0	5.338200
##	2022-07-11	5.254000	5.359000	5.250876	5.254000	0	5.254000
##	2022-07-12	5.377200	5.427000	5.371500	5.377200	0	5.377200
##	2022-07-13	5.436500	5.462500	5.362110	5.436500	0	5.436500
##	2022-07-14	5.390900	5.486600	5.388757	5.390900	0	5.390900
##	2022-07-15	5.422800	5.446100	5.375200	5.422800	0	5.422800
##	2022-07-18	5.410100	5.410600	5.350735	5.410100	0	5.410100
##	2022-07-19	5.436800	5.438500	5.371300	5.436800	0	5.436800
##	2022-07-20	5.413100	5.448000	5.384050	5.413100	0	5.413100
##	2022-07-21	5.470200	5.502300	5.431200	5.470200	0	5.470200
##	2022-07-22	5.497800	5.501500	5.435300	5.497800	0	5.497800
##	2022-07-25	5.496700	5.499600	5.399200	5.496700	0	5.496700
##	2022-07-26	5.356300	5.389700	5.331600	5.356300	0	5.356300
##	2022-07-27	5.350100	5.351000	5.291000	5.350100	0	5.350100
##	2022-07-28	5.243000	5.269000	5.174200	5.243000	0	5.243000
##	2022-07-29	5.182700	5.218888	5.148400	5.182700	0	5.182700
##	2022-08-01	5.171200	5.192600	5.127050	5.171200	0	5.171200
##	2022-08-02	5.184000	5.244200	5.157262	5.184000	0	5.184000
##	2022-08-03	5.277700	5.313000	5.246200	5.277700	0	5.277700
##	2022-08-04	5.282700	5.292000	5.211857	5.282700	0	5.282700

```

## 2022-08-05 5.211100 5.270994 5.181602 5.211100 0 5.211100
## 2022-08-08 5.164600 5.166300 5.102100 5.164600 0 5.164600
## 2022-08-09 5.110100 5.146700 5.093100 5.110100 0 5.110100
## 2022-08-10 5.123700 5.127700 5.035500 5.123700 0 5.123700
## 2022-08-11 5.093700 5.155400 5.056500 5.093700 0 5.093700
## 2022-08-12 5.157000 5.160900 5.082800 5.157000 0 5.157000
## 2022-08-15 5.074900 5.136300 5.067652 5.074900 0 5.074900
## 2022-08-16 5.095600 5.149100 5.075443 5.095600 0 5.095600
## 2022-08-17 5.141739 5.211300 5.141095 5.141739 0 5.141739
## 2022-08-18 5.165000 5.197000 5.129600 5.165000 0 5.165000
## 2022-08-19 5.167000 5.217000 5.164235 5.167000 0 5.167000
## 2022-08-22 5.168400 5.202100 5.161800 5.168400 0 5.168400
## 2022-08-23 5.156100 5.157100 5.071300 5.156100 0 5.156100
## 2022-08-24 5.103500 5.120300 5.077318 5.103500 0 5.103500
## 2022-08-25 5.110100 5.139700 5.081051 5.110100 0 5.110100
## 2022-08-26 5.108700 5.113700 5.064000 5.108700 0 5.108700
## 2022-08-29 5.062500 5.077800 5.024100 5.062500 0 5.062500
## 2022-08-30 5.027200 5.076500 4.998009 5.027200 0 5.027200
## 2022-08-31 5.121900 5.196800 5.093873 5.121900 0 5.121900
## 2022-09-01 5.181700 5.232300 5.144000 5.181700 0 5.181700

dim(dados.dolar.real)

## [1] 174 6

dolar.real <- na.omit(dados.dolar.real)
View(dolar.real)

dados.btc <- quantmod::getSymbols("BTC-USD", src = "yahoo", from = start, to = end, auto.a

## Warning: BTC-USD download failed; trying again.

## Error in getSymbols.yahoo(Symbols = "BTC-USD", env = <environment>, verbose = FALSE, : Un
## BTC-USD download failed after two attempts. Error message:
## Could not resolve host: query2.finance.yahoo.com

dados.btc

## BTC-USD.Open BTC-USD.High BTC-USD.Low BTC-USD.Close BTC-USD.Volume BTC-USD.Adj
## 2022-01-01 46311.75 47827.31 46288.48 47686.81 24582667004 476
## 2022-01-02 47680.93 47881.41 46856.94 47345.22 27951569547 473
## 2022-01-03 47343.54 47510.73 45835.96 46458.12 33071628362 464
## 2022-01-04 46458.85 47406.55 45752.46 45897.57 42494677905 458
## 2022-01-05 45899.36 46929.05 42798.22 43569.00 36851084859 435
## 2022-01-06 43565.51 43748.72 42645.54 43160.93 30208048289 431
## 2022-01-07 43153.57 43153.57 41077.45 41557.90 84196607520 415
## 2022-01-08 41561.46 42228.94 40672.28 41733.94 28066355845 417
## 2022-01-09 41734.73 42663.95 41338.16 41911.60 21294384372 419
## 2022-01-10 41910.23 42199.48 39796.57 41821.26 32104232331 418
## 2022-01-11 41819.51 43001.16 41407.75 42735.86 26327648900 427

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## 2022-01-12	42742.18	44135.37	42528.99	43949.10	33499938689	439
## 2022-01-13	43946.74	44278.42	42447.04	42591.57	47691135082	425
## 2022-01-14	42598.87	43346.69	41982.62	43099.70	23577403399	430
## 2022-01-15	43101.90	43724.67	42669.04	43177.40	18371348298	431
## 2022-01-16	43172.04	43436.81	42691.02	43113.88	17902097845	431
## 2022-01-17	43118.12	43179.39	41680.32	42250.55	21690904261	422
## 2022-01-18	42250.07	42534.40	41392.21	42375.63	22417209227	423
## 2022-01-19	42374.04	42478.30	41242.91	41744.33	23091543258	417
## 2022-01-20	41744.03	43413.02	40672.82	40680.42	20382033940	406
## 2022-01-21	40699.61	41060.53	35791.43	36457.32	43011992031	364
## 2022-01-22	36471.59	36688.81	34349.25	35030.25	39714385405	350
## 2022-01-23	35047.36	36433.31	34784.97	36276.80	26017975951	362
## 2022-01-24	36275.73	37247.52	33184.06	36654.33	41856658597	366
## 2022-01-25	36654.80	37444.57	35779.43	36954.00	26428189594	369
## 2022-01-26	36950.52	38825.41	36374.91	36852.12	31324598034	368
## 2022-01-27	36841.88	37148.32	35629.28	37138.23	25041426629	371
## 2022-01-28	37128.45	37952.88	36211.11	37784.33	22238830523	377
## 2022-01-29	37780.71	38576.26	37406.47	38138.18	17194183075	381
## 2022-01-30	38151.92	38266.34	37437.71	37917.60	14643548444	379
## 2022-01-31	37920.28	38647.26	36733.57	38483.12	20734730465	384
## 2022-02-01	38481.77	39115.13	38113.66	38743.27	20288500328	387
## 2022-02-02	38743.71	38834.62	36832.73	36952.98	19155189416	369
## 2022-02-03	36944.80	37154.60	36375.54	37154.60	18591534769	371
## 2022-02-04	37149.27	41527.79	37093.63	41500.88	29412210792	415
## 2022-02-05	41501.48	41847.16	41038.10	41441.16	19652846215	414
## 2022-02-06	41441.12	42500.79	41244.91	42412.43	16142097334	424
## 2022-02-07	42406.78	44401.86	41748.16	43840.29	28641855926	438
## 2022-02-08	43854.65	45293.87	42807.84	44118.45	33079398868	441
## 2022-02-09	44096.70	44727.80	43232.97	44338.80	23245887300	443
## 2022-02-10	44347.80	45661.17	43402.81	43565.11	32142048537	435
## 2022-02-11	43571.13	43810.83	42114.54	42407.94	26954925781	424
## 2022-02-12	42412.30	42992.55	41852.57	42244.47	18152390304	422
## 2022-02-13	42236.57	42693.05	41950.94	42197.52	14741589015	421
## 2022-02-14	42157.40	42775.78	41681.96	42586.92	20827783012	425
## 2022-02-15	42586.46	44667.22	42491.04	44575.20	22721659051	445
## 2022-02-16	44578.28	44578.28	43456.69	43961.86	19792547657	439
## 2022-02-17	43937.07	44132.97	40249.37	40538.01	26246662813	405
## 2022-02-18	40552.13	40929.15	39637.62	40030.98	23310007704	400
## 2022-02-19	40026.02	40418.88	39713.06	40122.16	13736557863	401
## 2022-02-20	40118.10	40119.89	38112.81	38431.38	18340576452	384
## 2022-02-21	38423.21	39394.44	36950.48	37075.28	29280402798	370
## 2022-02-22	37068.77	38359.86	36488.93	38286.03	25493150450	382
## 2022-02-23	38285.28	39122.39	37201.82	37296.57	21849073843	372
## 2022-02-24	37278.57	38968.84	34459.22	38332.61	46383802093	383
## 2022-02-25	38333.75	39630.32	38111.34	39214.22	26545599159	392
## 2022-02-26	39213.08	40005.35	38702.54	39105.15	17467554129	391

## 2022-02-27	39098.70	39778.94	37268.98	37709.79	23450127612	377
## 2022-02-28	37706.00	43760.46	37518.21	43193.23	35690014104	43
## 2022-03-01	43194.50	44793.60	42952.59	44354.64	32479047645	44
## 2022-03-02	44357.62	45077.58	43432.85	43924.12	29183112630	43
## 2022-03-03	43925.20	44021.58	41914.75	42451.79	24967782593	42
## 2022-03-04	42458.14	42479.61	38805.85	39137.61	28516271427	39
## 2022-03-05	39148.45	39566.34	38777.04	39400.59	16975917450	39
## 2022-03-06	39404.20	39640.18	38211.65	38419.98	19745229902	38
## 2022-03-07	38429.30	39430.23	37260.20	38062.04	28546143503	38
## 2022-03-08	38059.90	39304.44	37957.39	38737.27	25776583476	38
## 2022-03-09	38742.82	42465.67	38706.09	41982.93	32284121034	41
## 2022-03-10	41974.07	42004.73	38832.94	39437.46	31078064711	39
## 2022-03-11	39439.97	40081.68	38347.43	38794.97	26364890465	38
## 2022-03-12	38794.46	39308.60	38772.54	38904.01	14616450657	38
## 2022-03-13	38884.73	39209.35	37728.14	37849.66	17300745310	37
## 2022-03-14	37846.32	39742.50	37680.73	39666.75	24322159070	39
## 2022-03-15	39664.25	39794.63	38310.21	39338.79	23934000868	39
## 2022-03-16	39335.57	41465.45	39022.35	41143.93	39616916192	41
## 2022-03-17	41140.84	41287.54	40662.87	40951.38	22009601093	40
## 2022-03-18	40944.84	42195.75	40302.40	41801.16	34421564942	41
## 2022-03-19	41794.65	42316.55	41602.67	42190.65	19664853187	42
## 2022-03-20	42191.41	42241.16	41004.76	41247.82	20127946682	41
## 2022-03-21	41246.13	41454.41	40668.04	41078.00	24615543271	41
## 2022-03-22	41074.11	43124.71	40948.28	42358.81	32004652376	42
## 2022-03-23	42364.38	42893.51	41877.51	42892.96	25242943069	42
## 2022-03-24	42886.65	44131.86	42726.16	43960.93	31042992291	43
## 2022-03-25	43964.55	44999.49	43706.29	44348.73	30574413034	44
## 2022-03-26	44349.86	44736.00	44166.27	44500.83	16950455995	44
## 2022-03-27	44505.36	46827.55	44437.29	46820.49	28160889722	46
## 2022-03-28	46821.85	48086.84	46690.20	47128.00	36362175703	47
## 2022-03-29	47100.44	48022.29	47100.44	47465.73	31397059069	47
## 2022-03-30	47456.90	47655.15	46746.21	47062.66	29333883962	47
## 2022-03-31	47062.15	47512.03	45390.54	45538.68	33327427106	45
## 2022-04-01	45554.16	46616.24	44403.14	46281.64	38162644287	46
## 2022-04-02	46285.50	47028.28	45782.51	45868.95	29336594194	45
## 2022-04-03	45859.13	47313.48	45634.11	46453.57	25414397610	46
## 2022-04-04	46445.27	46791.09	45235.82	46622.68	32499785455	46
## 2022-04-05	46624.51	47106.14	45544.81	45555.99	29640604055	45
## 2022-04-06	45544.36	45544.36	43193.95	43206.74	39393395788	43
## 2022-04-07	43207.50	43860.70	42899.91	43503.85	26101973106	43
## 2022-04-08	43505.14	43903.02	42183.29	42287.66	27215995394	42
## 2022-04-09	42282.08	42786.82	42183.25	42782.14	16050772496	42
## 2022-04-10	42781.09	43376.38	42021.21	42207.67	17654475582	42
## 2022-04-11	42201.04	42424.59	39373.06	39521.90	33949912166	39
## 2022-04-12	39533.71	40617.59	39388.33	40127.18	30991500854	40
## 2022-04-13	40123.57	41430.05	39712.75	41166.73	27691105228	41

## 2022-04-14	41160.22	41451.48	39695.75	39935.52	24342001973	399
## 2022-04-15	39939.40	40617.72	39866.83	40553.46	21756855753	405
## 2022-04-16	40552.32	40633.68	40078.43	40424.48	16833150693	404
## 2022-04-17	40417.78	40570.73	39620.89	39716.95	19087633042	397
## 2022-04-18	39721.20	40986.32	38696.19	40826.21	33705182072	408
## 2022-04-19	40828.18	41672.96	40618.63	41502.75	25303206547	415
## 2022-04-20	41501.75	42126.30	40961.10	41374.38	27819532341	413
## 2022-04-21	41371.52	42893.58	40063.83	40527.36	35372786395	405
## 2022-04-22	40525.86	40777.76	39315.42	39740.32	28011716745	397
## 2022-04-23	39738.72	39935.86	39352.20	39486.73	16138021249	394
## 2022-04-24	39478.38	39845.93	39233.54	39469.29	17964398167	394
## 2022-04-25	39472.61	40491.75	38338.38	40458.31	35445730570	404
## 2022-04-26	40448.42	40713.89	37884.98	38117.46	34569088416	381
## 2022-04-27	38120.30	39397.92	37997.31	39241.12	30981015184	392
## 2022-04-28	39241.43	40269.46	38941.42	39773.83	33903704907	397
## 2022-04-29	39768.62	39887.27	38235.54	38609.82	30882994649	386
## 2022-04-30	38605.86	38771.21	37697.94	37714.88	23895713731	377
## 2022-05-01	37713.27	38627.86	37585.79	38469.09	27002760110	384
## 2022-05-02	38472.19	39074.97	38156.56	38529.33	32922642426	385
## 2022-05-03	38528.11	38630.00	37585.62	37750.45	27326943244	377
## 2022-05-04	37748.01	39902.95	37732.06	39698.37	36754404490	396
## 2022-05-05	39695.75	39789.28	35856.52	36575.14	43106256317	365
## 2022-05-06	36573.18	36624.36	35482.13	36040.92	37795577489	360
## 2022-05-07	36042.50	36129.93	34940.82	35501.95	24375896406	355
## 2022-05-08	35502.94	35502.94	33878.96	34059.27	36763041910	340
## 2022-05-09	34060.02	34222.07	30296.95	30296.95	63355494961	302
## 2022-05-10	30273.65	32596.31	29944.80	31022.91	59811038817	310
## 2022-05-11	31016.18	32013.40	28170.41	28936.36	70388855818	289
## 2022-05-12	28936.73	30032.44	26350.49	29047.75	66989173272	290
## 2022-05-13	29030.91	30924.80	28782.33	29283.10	42841124537	292
## 2022-05-14	29285.64	30192.80	28702.91	30101.27	28579868620	301
## 2022-05-15	30098.59	31308.19	29527.74	31305.11	25835372065	313
## 2022-05-16	31304.38	31305.34	29251.88	29862.92	32613897286	298
## 2022-05-17	29862.41	30694.49	29570.30	30425.86	29101473475	304
## 2022-05-18	30424.48	30618.72	28720.27	28720.27	31285268319	287
## 2022-05-19	28720.36	30430.75	28708.96	30314.33	33773447707	303
## 2022-05-20	30311.12	30664.98	28793.61	29200.74	30749382605	292
## 2022-05-21	29199.86	29588.87	29027.39	29432.23	17274840442	294
## 2022-05-22	29432.47	30425.86	29275.18	30323.72	21631532270	303
## 2022-05-23	30309.40	30590.59	28975.56	29098.91	31483454557	290
## 2022-05-24	29101.12	29774.36	28786.59	29655.59	26616506245	296
## 2022-05-25	29653.13	30157.79	29384.95	29562.36	27525063551	295
## 2022-05-26	29564.78	29834.16	28261.91	29267.22	36774325352	292
## 2022-05-27	29251.14	29346.94	28326.61	28627.57	36582005748	286
## 2022-05-28	28622.62	28814.90	28554.57	28814.90	35519577634	288
## 2022-05-29	29019.87	29498.01	28841.11	29445.96	18093886409	294



## 2022-05-30	29443.37	31949.63	29303.57	31726.39	39277993274	317
## 2022-05-31	31723.87	32249.86	31286.15	31792.31	33538210634	317
## 2022-06-01	31792.55	31957.29	29501.59	29799.08	41135817341	297
## 2022-06-02	29794.89	30604.73	29652.71	30467.49	29083562061	304
## 2022-06-03	30467.81	30633.04	29375.69	29704.39	26175547452	297
## 2022-06-04	29706.14	29930.56	29500.01	29832.91	16588370958	298
## 2022-06-05	29835.12	30117.74	29574.45	29906.66	17264085441	299
## 2022-06-06	29910.28	31693.29	29894.19	31370.67	31947336829	313
## 2022-06-07	31371.74	31489.68	29311.68	31155.48	40770974039	311
## 2022-06-08	31151.48	31253.69	29944.40	30214.36	30242059107	302
## 2022-06-09	30215.28	30609.31	30020.27	30112.00	21692004719	301
## 2022-06-10	30110.33	30245.81	28978.15	29083.80	29867476527	290
## 2022-06-11	29084.67	29401.92	28236.21	28360.81	27246574439	283
## 2022-06-12	28373.51	28502.69	26762.65	26762.65	34163220274	267
## 2022-06-13	26737.58	26795.59	22141.26	22487.39	68204556440	224
## 2022-06-14	22487.99	23018.95	20950.82	22206.79	50913575242	222
## 2022-06-15	22196.73	22642.67	20178.38	22572.84	54912007015	225
## 2022-06-16	22576.30	22868.92	20265.23	20381.65	31183975654	203
## 2022-06-17	20385.72	21243.31	20326.52	20471.48	27132421514	204
## 2022-06-18	20473.43	20736.04	17708.62	19017.64	42009436760	190
## 2022-06-19	19010.90	20683.82	18067.15	20553.27	35329942625	205
## 2022-06-20	20553.37	20913.32	19689.17	20599.54	30818458597	205
## 2022-06-21	20594.29	21620.63	20415.06	20710.60	28970212744	207
## 2022-06-22	20719.41	20835.75	19848.08	19987.03	28574793478	199
## 2022-06-23	19986.61	21135.76	19950.12	21085.88	26188097173	210
## 2022-06-24	21084.65	21472.92	20777.51	21231.66	24957784918	212
## 2022-06-25	21233.61	21520.91	20964.59	21502.34	18372538715	215
## 2022-06-26	21496.49	21783.72	21016.27	21027.29	18027170497	210
## 2022-06-27	21028.24	21478.09	20620.20	20735.48	20965695707	207
## 2022-06-28	20731.54	21164.42	20228.81	20280.63	21381535161	202
## 2022-06-29	20281.17	20364.16	19937.79	20104.02	23552740328	201
## 2022-06-30	20108.31	20141.16	18729.66	19784.73	26267239923	197
## 2022-07-01	19820.47	20632.67	19073.71	19269.37	30767551159	192
## 2022-07-02	19274.84	19371.75	19027.08	19242.26	18100418740	192
## 2022-07-03	19242.10	19558.27	18966.95	19297.08	16390821947	192
## 2022-07-04	19297.31	20258.75	19063.07	20231.26	21594638208	202
## 2022-07-05	20225.35	20635.47	19341.23	20190.12	26715546990	201
## 2022-07-06	20194.62	20595.53	19823.51	20548.25	24598943708	205
## 2022-07-07	20547.81	21771.82	20296.10	21637.59	25814972520	216
## 2022-07-08	21637.15	22314.94	21257.45	21731.12	49899834488	217
## 2022-07-09	21716.83	21877.14	21445.96	21592.21	29641127858	215
## 2022-07-10	21591.08	21591.08	20727.12	20860.45	28688807249	208
## 2022-07-11	20856.35	20856.35	19924.54	19970.56	24150249025	199
## 2022-07-12	19970.47	20043.45	19308.53	19323.91	25810220018	193
## 2022-07-13	19325.97	20223.05	18999.95	20212.07	33042430345	202
## 2022-07-14	20211.47	20789.89	19689.26	20569.92	31158743333	205

## 2022-07-15	20573.16	21138.24	20397.00	20836.33	25905575359	208
## 2022-07-16	20834.10	21514.40	20518.90	21190.32	24302954056	211
## 2022-07-17	21195.04	21600.64	20778.18	20779.34	22927802083	207
## 2022-07-18	20781.91	22633.03	20781.91	22485.69	39974475562	224
## 2022-07-19	22467.85	23666.96	21683.41	23389.43	48765202697	233
## 2022-07-20	23393.19	24196.82	23009.95	23231.73	42932549127	232
## 2022-07-21	23233.20	23388.32	22431.15	23164.63	33631012204	231
## 2022-07-22	23163.75	23671.93	22603.42	22714.98	31421555646	227
## 2022-07-23	22706.98	22977.21	22002.91	22465.48	24021799169	224
## 2022-07-24	22465.51	22974.00	22306.84	22609.16	23565495303	226
## 2022-07-25	22607.16	22649.12	21361.64	21361.70	35574561406	213
## 2022-07-26	21361.12	21361.12	20776.82	21239.75	28624673855	212
## 2022-07-27	21244.17	22986.53	21070.81	22930.55	31758955233	229
## 2022-07-28	22933.64	24110.47	22722.27	23843.89	40212386158	238
## 2022-07-29	23845.21	24294.79	23481.17	23804.63	35887249746	238
## 2022-07-30	23796.82	24572.58	23580.51	23656.21	28148218301	236
## 2022-07-31	23652.07	24121.64	23275.70	23336.90	23553591896	233
## 2022-08-01	23336.72	23464.79	22890.80	23314.20	25849159141	233
## 2022-08-02	23308.43	23415.04	22710.08	22978.12	28389250717	229
## 2022-08-03	22981.30	23578.65	22747.84	22846.51	26288169966	228
## 2022-08-04	22848.21	23198.01	22485.70	22630.96	25120229769	226
## 2022-08-05	22626.83	23422.83	22612.18	23289.31	28881249043	232
## 2022-08-06	23291.42	23326.56	22961.28	22961.28	15978259885	229
## 2022-08-07	22963.51	23359.01	22894.56	23175.89	15886817043	231
## 2022-08-08	23179.53	24203.69	23176.55	23809.49	28575544847	238
## 2022-08-09	23811.48	23898.62	22982.00	23164.32	23555719219	231
## 2022-08-10	23162.90	24127.41	22771.52	23947.64	32837431722	239
## 2022-08-11	23948.35	24822.63	23901.00	23957.53	37127036580	239
## 2022-08-12	23957.20	24412.57	23657.27	24402.82	27265804688	244
## 2022-08-13	24402.19	24860.05	24346.12	24424.07	22987346289	244
## 2022-08-14	24429.06	24974.91	24206.26	24319.33	22994133555	243
## 2022-08-15	24318.32	25135.59	23839.78	24136.97	35123501685	241
## 2022-08-16	24126.14	24228.42	23733.50	23883.29	27753685646	238
## 2022-08-17	23881.32	24407.06	23243.35	23336.00	30931623076	233
## 2022-08-18	23341.04	23563.83	23177.60	23212.74	23747613147	232
## 2022-08-19	23213.31	23213.31	20868.85	20877.55	40509610260	208
## 2022-08-20	20872.84	21350.81	20856.73	21166.06	27595671000	211
## 2022-08-21	21160.39	21668.85	21103.20	21534.12	23102307723	215
## 2022-08-22	21531.46	21531.46	20939.18	21398.91	31666498758	213
## 2022-08-23	21401.04	21646.20	20955.14	21528.09	31878280659	215
## 2022-08-24	21526.46	21783.08	21195.01	21395.02	31962253368	213
## 2022-08-25	21395.46	21789.64	21362.44	21600.90	31028679593	216
## 2022-08-26	21596.09	21804.91	20199.48	20260.02	42326789564	202
## 2022-08-27	20262.48	20340.78	19890.52	20041.74	30116729776	200
## 2022-08-28	20041.04	20139.05	19616.81	19616.81	24366810591	196
## 2022-08-29	19615.15	20357.46	19600.79	20297.99	32637854078	202

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## 2022-08-30      20298.61      20542.64      19617.64      19796.81      34483360283      197
## 2022-08-31      19799.58      20420.99      19799.58      20049.76      33225232872      200
## 2022-09-01      20050.50      20198.39      19653.97      20127.14      30182031010      201

dim(dados.btc)

## [1] 244      6

dolar.bitcoin <- na.omit(dados.btc)
View(dolar.bitcoin)
```

### Dados Dow Jones

```
dados.dj <- quantmod::getSymbols("^DJI",src = "yahoo", from = start,to = end,auto.assign = FALSE)

## Warning: ^DJI download failed; trying again.

## Error in getSymbols.yahoo(Symbols = "^DJI", env = <environment>, verbose = FALSE, : Unable to get data for ^DJI
## ^DJI download failed after two attempts. Error message:
## Could not resolve host: query2.finance.yahoo.com

dados.dj

##           DJI.Open DJI.High  DJI.Low DJI.Close DJI.Volume DJI.Adjusted
## 2022-01-03 36321.59 36595.82 36246.45 36585.06 347930000      36585.06
## 2022-01-04 36636.00 36934.84 36636.00 36799.65 435080000      36799.65
## 2022-01-05 36722.60 36952.65 36400.39 36407.11 462040000      36407.11
## 2022-01-06 36409.05 36464.19 36200.68 36236.47 385890000      36236.47
## 2022-01-07 36249.59 36382.84 36111.53 36231.66 356110000      36231.66
## 2022-01-10 36175.21 36175.21 35639.91 36068.87 430680000      36068.87
## 2022-01-11 36058.85 36271.47 35769.38 36252.02 356850000      36252.02
## 2022-01-12 36336.16 36453.49 36168.15 36290.32 310180000      36290.32
## 2022-01-13 36312.49 36513.88 36044.22 36113.62 343640000      36113.62
## 2022-01-14 35996.43 35996.43 35641.49 35911.81 389200000      35911.81
## 2022-01-18 35661.76 35661.76 35262.02 35368.47 427260000      35368.47
## 2022-01-19 35412.30 35547.83 35015.49 35028.65 393080000      35028.65
## 2022-01-20 35102.66 35490.20 34670.12 34715.39 369070000      34715.39
## 2022-01-21 34701.69 34896.67 34229.55 34265.37 523880000      34265.37
## 2022-01-24 34070.61 34420.99 33150.33 34364.50 664010000      34364.50
## 2022-01-25 34186.64 34591.04 33545.52 34297.73 506430000      34297.73
## 2022-01-26 34520.82 34815.67 33876.48 34168.09 546330000      34168.09
## 2022-01-27 34261.75 34773.32 34007.78 34160.78 527780000      34160.78
## 2022-01-28 34135.24 34731.77 33807.51 34725.47 568440000      34725.47
## 2022-01-31 34691.17 35148.14 34496.10 35131.86 468070000      35131.86
## 2022-02-01 35151.47 35441.09 34977.95 35405.24 386080000      35405.24
## 2022-02-02 35378.19 35679.20 35290.12 35629.33 359540000      35629.33
## 2022-02-03 35520.08 35535.94 35071.06 35111.16 381020000      35111.16
## 2022-02-04 35095.74 35333.55 34799.08 35089.74 349880000      35089.74
## 2022-02-07 35108.38 35325.01 34993.98 35091.13 328910000      35091.13
```

##	2022-02-08	35160.68	35544.89	35090.42	35462.78	319190000	35462.78
##	2022-02-09	35614.90	35824.28	35614.90	35768.06	333610000	35768.06
##	2022-02-10	35630.81	35800.24	35100.72	35241.59	411620000	35241.59
##	2022-02-11	35267.89	35431.15	34620.52	34738.06	398860000	34738.06
##	2022-02-14	34694.50	34744.56	34304.28	34566.17	370320000	34566.17
##	2022-02-15	34686.19	35047.79	34686.19	34988.84	305670000	34988.84
##	2022-02-16	34951.83	35042.09	34642.64	34934.27	294410000	34934.27
##	2022-02-17	34858.47	34858.47	34246.23	34312.03	348720000	34312.03
##	2022-02-18	34310.45	34423.58	33976.18	34079.18	414080000	34079.18
##	2022-02-22	33974.09	34024.74	33364.29	33596.61	432090000	33596.61
##	2022-02-23	33680.97	33832.59	33084.90	33131.76	370600000	33131.76
##	2022-02-24	32830.33	33269.34	32272.64	33223.83	590850000	33223.83
##	2022-02-25	33277.22	34095.74	33277.22	34058.75	417630000	34058.75
##	2022-02-28	33870.62	33963.63	33469.31	33892.60	443460000	33892.60
##	2022-03-01	33813.48	33870.14	33107.67	33294.95	438730000	33294.95
##	2022-03-02	33379.51	34013.67	33379.51	33891.35	400920000	33891.35
##	2022-03-03	33972.87	34179.07	33641.53	33794.66	369740000	33794.66
##	2022-03-04	33655.43	33655.43	33254.12	33614.80	408390000	33614.80
##	2022-03-07	33579.75	33579.75	32806.15	32817.38	488400000	32817.38
##	2022-03-08	32885.17	33402.98	32578.73	32632.64	553750000	32632.64
##	2022-03-09	32860.42	33457.28	32860.42	33286.25	418670000	33286.25
##	2022-03-10	33106.77	33236.59	32819.76	33174.07	399480000	33174.07
##	2022-03-11	33279.72	33515.61	32911.89	32944.19	369480000	32944.19
##	2022-03-14	33000.37	33395.59	32818.16	32945.24	394940000	32945.24
##	2022-03-15	32989.27	33620.84	32989.27	33544.34	388810000	33544.34
##	2022-03-16	33653.93	34075.94	33391.24	34063.10	427400000	34063.10
##	2022-03-17	33995.39	34483.92	33896.06	34480.76	339470000	34480.76
##	2022-03-18	34466.72	34755.20	34279.83	34754.93	615420000	34754.93
##	2022-03-21	34669.85	34808.28	34341.81	34552.99	408490000	34552.99
##	2022-03-22	34583.24	34882.03	34583.24	34807.46	368550000	34807.46
##	2022-03-23	34748.84	34748.84	34352.96	34358.50	347880000	34358.50
##	2022-03-24	34406.81	34713.56	34355.42	34707.94	324870000	34707.94
##	2022-03-25	34702.39	34942.70	34631.52	34861.24	285440000	34861.24
##	2022-03-28	34833.03	34957.93	34552.23	34955.89	299790000	34955.89
##	2022-03-29	35114.35	35372.26	35030.07	35294.19	355050000	35294.19
##	2022-03-30	35273.63	35361.36	35058.58	35228.81	317320000	35228.81
##	2022-03-31	35201.52	35201.52	34677.99	34678.35	433400000	34678.35
##	2022-04-01	34740.89	34847.91	34538.25	34818.27	340400000	34818.27
##	2022-04-04	34799.98	34940.78	34615.38	34921.88	316570000	34921.88
##	2022-04-05	34876.33	35112.21	34566.04	34641.18	304010000	34641.18
##	2022-04-06	34520.34	34609.84	34277.17	34496.51	386250000	34496.51
##	2022-04-07	34439.24	34705.83	34190.95	34583.57	319870000	34583.57
##	2022-04-08	34569.24	34908.46	34470.19	34721.12	301750000	34721.12
##	2022-04-11	34630.27	34701.34	34272.29	34308.08	333290000	34308.08
##	2022-04-12	34412.51	34669.97	34102.81	34220.36	333510000	34220.36
##	2022-04-13	34166.64	34598.36	34140.64	34564.59	313630000	34564.59

##	2022-04-14	34628.46	34889.17	34437.50	34451.23	353680000	34451.23
##	2022-04-18	34411.49	34618.29	34279.08	34411.69	264110000	34411.69
##	2022-04-19	34394.62	34983.11	34394.62	34911.20	296350000	34911.20
##	2022-04-20	34962.67	35315.40	34962.67	35160.79	337620000	35160.79
##	2022-04-21	35258.80	35492.22	34723.82	34792.76	366390000	34792.76
##	2022-04-22	34727.38	34727.38	33773.39	33811.40	373280000	33811.40
##	2022-04-25	33731.65	34106.01	33323.37	34049.46	416900000	34049.46
##	2022-04-26	33907.49	33909.51	33230.95	33240.18	400020000	33240.18
##	2022-04-27	33450.92	33697.18	33108.89	33301.93	447230000	33301.93
##	2022-04-28	33425.96	34054.79	33248.46	33916.39	440380000	33916.39
##	2022-04-29	33787.01	33919.59	32913.15	32977.21	501560000	32977.21
##	2022-05-02	32978.49	33224.95	32449.87	33061.50	453390000	33061.50
##	2022-05-03	33086.09	33341.58	32914.75	33128.79	364420000	33128.79
##	2022-05-04	33171.80	34117.74	33021.84	34061.06	411060000	34061.06
##	2022-05-05	33854.17	33854.17	32685.10	32997.97	448420000	32997.97
##	2022-05-06	32773.88	33055.84	32474.69	32899.37	416520000	32899.37
##	2022-05-09	32685.17	32685.17	32121.98	32245.70	470770000	32245.70
##	2022-05-10	32504.09	32752.17	31887.89	32160.74	439290000	32160.74
##	2022-05-11	32123.24	32584.02	31798.86	31834.11	458460000	31834.11
##	2022-05-12	31699.04	31914.46	31228.22	31730.30	544240000	31730.30
##	2022-05-13	31963.86	32276.05	31862.79	32196.66	388520000	32196.66
##	2022-05-16	32152.15	32514.02	31928.18	32223.42	330030000	32223.42
##	2022-05-17	32427.00	32689.14	32308.15	32654.59	389310000	32654.59
##	2022-05-18	32468.67	32468.67	31393.95	31490.07	465060000	31490.07
##	2022-05-19	31262.62	31569.13	31016.41	31253.13	517190000	31253.13
##	2022-05-20	31426.94	31515.78	30635.76	31261.90	495510000	31261.90
##	2022-05-23	31395.89	31968.42	31395.89	31880.24	402010000	31880.24
##	2022-05-24	31717.61	32014.86	31365.59	31928.62	382950000	31928.62
##	2022-05-25	31816.31	32254.44	31754.33	32120.28	343460000	32120.28
##	2022-05-26	32248.17	32774.14	32248.17	32637.19	351220000	32637.19
##	2022-05-27	32735.09	33213.62	32682.01	33212.96	328770000	33212.96
##	2022-05-31	33160.59	33240.22	32752.34	32990.12	533560000	32990.12
##	2022-06-01	33156.31	33272.34	32584.76	32813.23	338210000	32813.23
##	2022-06-02	32809.01	33248.61	32509.43	33248.28	333210000	33248.28
##	2022-06-03	32986.32	33135.61	32839.21	32899.70	298570000	32899.70
##	2022-06-06	33032.04	33235.37	32819.50	32915.78	253010000	32915.78
##	2022-06-07	32783.03	33207.45	32641.85	33180.14	270750000	33180.14
##	2022-06-08	33087.07	33156.50	32824.37	32910.90	270470000	32910.90
##	2022-06-09	32828.62	32956.73	32267.78	32272.79	289710000	32272.79
##	2022-06-10	32053.52	32053.52	31387.84	31392.79	362300000	31392.79
##	2022-06-13	31144.91	31144.91	30373.72	30516.74	472290000	30516.74
##	2022-06-14	30592.34	30690.80	30144.23	30364.83	366800000	30364.83
##	2022-06-15	30570.50	31011.97	30185.08	30668.53	392670000	30668.53
##	2022-06-16	30305.74	30305.74	29740.35	29927.07	442910000	29927.07
##	2022-06-17	29912.70	30167.52	29653.29	29888.78	692830000	29888.78
##	2022-06-21	30074.69	30653.98	30074.69	30530.25	376900000	30530.25

##	2022-06-22	30352.57	30777.92	30166.01	30483.13	343490000	30483.13
##	2022-06-23	30570.33	30715.63	30293.40	30677.36	361420000	30677.36
##	2022-06-24	30846.94	31517.29	30846.94	31500.68	465480000	31500.68
##	2022-06-27	31533.60	31598.59	31351.37	31438.26	309910000	31438.26
##	2022-06-28	31549.05	31885.09	30934.33	30946.99	350780000	30946.99
##	2022-06-29	31067.41	31152.96	30894.53	31029.31	269390000	31029.31
##	2022-06-30	30790.00	30979.85	30431.87	30775.43	394070000	30775.43
##	2022-07-01	30737.77	31139.35	30487.79	31097.26	310440000	31097.26
##	2022-07-05	30903.12	30971.74	30355.12	30967.82	323080000	30967.82
##	2022-07-06	30957.30	31224.69	30794.84	31037.68	289800000	31037.68
##	2022-07-07	31190.65	31421.84	31154.64	31384.55	296620000	31384.55
##	2022-07-08	31348.43	31511.46	31212.45	31338.15	238120000	31338.15
##	2022-07-11	31277.98	31367.55	31114.40	31173.84	245020000	31173.84
##	2022-07-12	31113.31	31346.10	30860.51	30981.33	324190000	30981.33
##	2022-07-13	30743.63	30979.17	30514.61	30772.79	291830000	30772.79
##	2022-07-14	30451.80	30680.12	30143.93	30630.17	325130000	30630.17
##	2022-07-15	30775.37	31288.26	30775.37	31288.26	321570000	31288.26
##	2022-07-18	31475.98	31644.68	30982.97	31072.61	309960000	31072.61
##	2022-07-19	31165.91	31842.25	31165.91	31827.05	378720000	31827.05
##	2022-07-20	31829.99	31944.45	31646.95	31874.84	313520000	31874.84
##	2022-07-21	31826.49	32040.63	31534.08	32036.90	302320000	32036.90
##	2022-07-22	32167.92	32219.25	31731.47	31899.29	319880000	31899.29
##	2022-07-25	31950.93	32029.03	31821.67	31990.04	255450000	31990.04
##	2022-07-26	31950.04	31950.04	31705.36	31761.54	324930000	31761.54
##	2022-07-27	31865.05	32336.23	31799.43	32197.59	365480000	32197.59
##	2022-07-28	32197.62	32609.54	31982.61	32529.63	331110000	32529.63
##	2022-07-29	32515.62	32910.18	32493.02	32845.13	487360000	32845.13
##	2022-08-01	32755.71	32972.03	32640.79	32798.40	321180000	32798.40
##	2022-08-02	32691.29	32772.93	32387.12	32396.17	316740000	32396.17
##	2022-08-03	32514.21	32912.74	32514.21	32812.50	342160000	32812.50
##	2022-08-04	32805.69	32829.22	32652.63	32726.82	315590000	32726.82
##	2022-08-05	32593.90	32814.61	32489.62	32803.47	273010000	32803.47
##	2022-08-08	32877.36	33109.96	32769.10	32832.54	275350000	32832.54
##	2022-08-09	32807.36	32877.53	32702.66	32774.41	281080000	32774.41
##	2022-08-10	33130.63	33364.41	33130.63	33309.51	311740000	33309.51
##	2022-08-11	33451.51	33651.80	33289.83	33336.67	308030000	33336.67
##	2022-08-12	33430.72	33767.09	33398.32	33761.05	299140000	33761.05
##	2022-08-15	33710.70	33954.71	33582.96	33912.44	262670000	33912.44
##	2022-08-16	33924.35	34281.36	33852.57	34152.01	288670000	34152.01
##	2022-08-17	34029.55	34161.01	33828.41	33980.32	281390000	33980.32
##	2022-08-18	33981.86	34043.83	33844.46	33999.04	282550000	33999.04
##	2022-08-19	33904.69	33904.69	33627.09	33706.74	293990000	33706.74
##	2022-08-22	33586.59	33586.59	33007.63	33063.61	308900000	33063.61
##	2022-08-23	33033.52	33138.26	32858.89	32909.59	251870000	32909.59
##	2022-08-24	32899.01	33095.50	32828.56	32969.23	256900000	32969.23
##	2022-08-25	33029.27	33306.09	32889.85	33291.78	308530000	33291.78

```
## 2022-08-26 33293.43 33364.70 32278.22 32283.40 352850000 32283.40
## 2022-08-29 32188.00 32325.16 31972.79 32098.99 317820000 32098.99
## 2022-08-30 32163.84 32205.66 31647.22 31790.87 317150000 31790.87
## 2022-08-31 31827.15 31966.04 31509.59 31510.43 392780000 31510.43
```

```
dim(dados.dj)
```

```
## [1] 167 6
```

```
dj <- na.omit(dados.dj)
```

**Cria o vetor de preco de fechamento**

```
preco_fechamento <- dados.dj$"DJI.Close"
preco_fechamento
```

```
##          DJI.Close
## 2022-01-03 36585.06
## 2022-01-04 36799.65
## 2022-01-05 36407.11
## 2022-01-06 36236.47
## 2022-01-07 36231.66
## 2022-01-10 36068.87
## 2022-01-11 36252.02
## 2022-01-12 36290.32
## 2022-01-13 36113.62
## 2022-01-14 35911.81
## 2022-01-18 35368.47
## 2022-01-19 35028.65
## 2022-01-20 34715.39
## 2022-01-21 34265.37
## 2022-01-24 34364.50
## 2022-01-25 34297.73
## 2022-01-26 34168.09
## 2022-01-27 34160.78
## 2022-01-28 34725.47
## 2022-01-31 35131.86
## 2022-02-01 35405.24
## 2022-02-02 35629.33
## 2022-02-03 35111.16
## 2022-02-04 35089.74
## 2022-02-07 35091.13
## 2022-02-08 35462.78
## 2022-02-09 35768.06
## 2022-02-10 35241.59
## 2022-02-11 34738.06
## 2022-02-14 34566.17
## 2022-02-15 34988.84
```

##	2022-02-16	34934.27
##	2022-02-17	34312.03
##	2022-02-18	34079.18
##	2022-02-22	33596.61
##	2022-02-23	33131.76
##	2022-02-24	33223.83
##	2022-02-25	34058.75
##	2022-02-28	33892.60
##	2022-03-01	33294.95
##	2022-03-02	33891.35
##	2022-03-03	33794.66
##	2022-03-04	33614.80
##	2022-03-07	32817.38
##	2022-03-08	32632.64
##	2022-03-09	33286.25
##	2022-03-10	33174.07
##	2022-03-11	32944.19
##	2022-03-14	32945.24
##	2022-03-15	33544.34
##	2022-03-16	34063.10
##	2022-03-17	34480.76
##	2022-03-18	34754.93
##	2022-03-21	34552.99
##	2022-03-22	34807.46
##	2022-03-23	34358.50
##	2022-03-24	34707.94
##	2022-03-25	34861.24
##	2022-03-28	34955.89
##	2022-03-29	35294.19
##	2022-03-30	35228.81
##	2022-03-31	34678.35
##	2022-04-01	34818.27
##	2022-04-04	34921.88
##	2022-04-05	34641.18
##	2022-04-06	34496.51
##	2022-04-07	34583.57
##	2022-04-08	34721.12
##	2022-04-11	34308.08
##	2022-04-12	34220.36
##	2022-04-13	34564.59
##	2022-04-14	34451.23
##	2022-04-18	34411.69
##	2022-04-19	34911.20
##	2022-04-20	35160.79
##	2022-04-21	34792.76
##	2022-04-22	33811.40



##	2022-04-25	34049.46
##	2022-04-26	33240.18
##	2022-04-27	33301.93
##	2022-04-28	33916.39
##	2022-04-29	32977.21
##	2022-05-02	33061.50
##	2022-05-03	33128.79
##	2022-05-04	34061.06
##	2022-05-05	32997.97
##	2022-05-06	32899.37
##	2022-05-09	32245.70
##	2022-05-10	32160.74
##	2022-05-11	31834.11
##	2022-05-12	31730.30
##	2022-05-13	32196.66
##	2022-05-16	32223.42
##	2022-05-17	32654.59
##	2022-05-18	31490.07
##	2022-05-19	31253.13
##	2022-05-20	31261.90
##	2022-05-23	31880.24
##	2022-05-24	31928.62
##	2022-05-25	32120.28
##	2022-05-26	32637.19
##	2022-05-27	33212.96
##	2022-05-31	32990.12
##	2022-06-01	32813.23
##	2022-06-02	33248.28
##	2022-06-03	32899.70
##	2022-06-06	32915.78
##	2022-06-07	33180.14
##	2022-06-08	32910.90
##	2022-06-09	32272.79
##	2022-06-10	31392.79
##	2022-06-13	30516.74
##	2022-06-14	30364.83
##	2022-06-15	30668.53
##	2022-06-16	29927.07
##	2022-06-17	29888.78
##	2022-06-21	30530.25
##	2022-06-22	30483.13
##	2022-06-23	30677.36
##	2022-06-24	31500.68
##	2022-06-27	31438.26
##	2022-06-28	30946.99
##	2022-06-29	31029.31

##	2022-06-30	30775.43
##	2022-07-01	31097.26
##	2022-07-05	30967.82
##	2022-07-06	31037.68
##	2022-07-07	31384.55
##	2022-07-08	31338.15
##	2022-07-11	31173.84
##	2022-07-12	30981.33
##	2022-07-13	30772.79
##	2022-07-14	30630.17
##	2022-07-15	31288.26
##	2022-07-18	31072.61
##	2022-07-19	31827.05
##	2022-07-20	31874.84
##	2022-07-21	32036.90
##	2022-07-22	31899.29
##	2022-07-25	31990.04
##	2022-07-26	31761.54
##	2022-07-27	32197.59
##	2022-07-28	32529.63
##	2022-07-29	32845.13
##	2022-08-01	32798.40
##	2022-08-02	32396.17
##	2022-08-03	32812.50
##	2022-08-04	32726.82
##	2022-08-05	32803.47
##	2022-08-08	32832.54
##	2022-08-09	32774.41
##	2022-08-10	33309.51
##	2022-08-11	33336.67
##	2022-08-12	33761.05
##	2022-08-15	33912.44
##	2022-08-16	34152.01
##	2022-08-17	33980.32
##	2022-08-18	33999.04
##	2022-08-19	33706.74
##	2022-08-22	33063.61
##	2022-08-23	32909.59
##	2022-08-24	32969.23
##	2022-08-25	33291.78
##	2022-08-26	32283.40
##	2022-08-29	32098.99
##	2022-08-30	31790.87
##	2022-08-31	31510.43

### 1. Media do Preco de Fechamento —

```
media_pf <- mean(preco_fechamento)
media_pf
## [1] 33333.56
```

Media: 4

### 2. Moda do Preco de Fechamento —

```
tab_preco_fechamento <- table(preco_fechamento)
View(tab_preco_fechamento)
moda2_pf <- names(tab_preco_fechamento)[which(tab_preco_fechamento==max(tab_preco_fechamento))]
moda2_pf

## [1] "29888.779297" "29927.070313" "30364.830078" "30483.130859" "30516.740234" "30530.2
## [8] "30668.529297" "30677.359375" "30772.789063" "30775.429688" "30946.990234" "30967.8
## [15] "31029.310547" "31037.679688" "31072.609375" "31097.259766" "31173.839844" "31253.1
## [22] "31288.259766" "31338.150391" "31384.550781" "31392.789063" "31438.259766" "31490.0
## [29] "31510.429688" "31730.300781" "31761.539063" "31790.869141" "31827.050781" "31834.1
## [36] "31880.240234" "31899.289063" "31928.619141" "31990.039063" "32036.900391" "32098.9
## [43] "32160.740234" "32196.660156" "32197.589844" "32223.419922" "32245.699219" "32272.7
## [50] "32396.169922" "32529.630859" "32632.640625" "32637.189453" "32654.589844" "32726.8
## [57] "32798.398438" "32803.46875" "32812.5" "32813.230469" "32817.378906" "32832.5
## [64] "32899.371094" "32899.699219" "32909.589844" "32910.898438" "32915.78125" "32944.1
## [71] "32969.230469" "32977.210938" "32990.121094" "32997.96875" "33061.5" "33063.6
## [78] "33131.761719" "33174.070313" "33180.140625" "33212.960938" "33223.828125" "33240.1
## [85] "33286.25" "33291.78125" "33294.949219" "33301.929688" "33309.511719" "33336.6
## [92] "33596.609375" "33614.800781" "33706.738281" "33761.050781" "33794.660156" "33811.3
## [99] "33892.601563" "33912.441406" "33916.390625" "33980.320313" "33999.039063" "34049.4
## [106] "34061.058594" "34063.101563" "34079.179688" "34152.011719" "34160.78125" "34168.0
## [113] "34265.371094" "34297.730469" "34308.078125" "34312.03125" "34358.5" "34364.5
## [120] "34451.230469" "34480.761719" "34496.511719" "34552.988281" "34564.589844" "34566.1
## [127] "34641.179688" "34678.351563" "34707.941406" "34715.390625" "34721.121094" "34725.4
## [134] "34754.929688" "34792.761719" "34807.460938" "34818.269531" "34861.238281" "34911.1
## [141] "34934.269531" "34955.890625" "34988.839844" "35028.648438" "35089.738281" "35091.1
## [148] "35131.859375" "35160.789063" "35228.808594" "35241.589844" "35294.191406" "35368.4
## [155] "35462.78125" "35629.328125" "35768.058594" "35911.808594" "36068.871094" "36113.6
## [162] "36236.46875" "36252.019531" "36290.320313" "36407.109375" "36585.058594" "36799.6
```

### 3. Mediana do Preco de Fechamento —

```
mediana_pf <- median(preco_fechamento)
mediana_pf
## [1] 33248.28
```

#### 4. Variancia Nao Viesada —

```
variancia_pf <- var(preco_fechamento)
variancia_pf

##           DJI.Close
## DJI.Close    2520219
```

#### 5. Desvio-padrao —

```
desv_pad_pf <- sd(preco_fechamento)
desv_pad_pf

## [1] 1587.52
```

#### 6. Grafico de linha do Preco de Fechamento —

```
ggplot(dados.dj, aes(x = index(dados.dj), y = preco_fechamento)) + geom_line() + labs(title = "Preco de Fechamento")
## Don't know how to automatically pick scale for object of type xts/zoo. Defaulting to continuous scale.
```

#### 7. Retorno, com base no Preco de Fechamento —

```
retorno_pf <- (preco_fechamento - shift(preco_fechamento, 1L, type="lag"))/shift(preco_fechamento, 1L, type="lag")
retorno_pf <- na.omit(retorno_pf)
tabela_preco_retorno <- cbind(preco_fechamento, retorno_pf)
head(tabela_preco_retorno)

##           DJI.Close    DJI.Close.1
## 2022-01-03  36585.06             NA
## 2022-01-04  36799.65    0.0058655050
## 2022-01-05  36407.11   -0.0106669243
## 2022-01-06  36236.47   -0.0046870138
## 2022-01-07  36231.66   -0.0001327004
## 2022-01-10  36068.87   -0.0044930059
```

#### 8. Grafico de linha do Retorno —

```
ggplot(retorno_pf, aes(x = index(retorno_pf), y = 100*retorno_pf)) + geom_line() + labs(title = "Retorno")
## Don't know how to automatically pick scale for object of type xts/zoo. Defaulting to continuous scale.
```

#### 9. Box plot para dados originais (Preco de Fechamento e Retorno) e padronizados —

```
boxplot_pf <- ggplot(data = preco_fechamento, aes(x = "", y = preco_fechamento)) +
  geom_violin(trim = FALSE, color="blue") +
  geom_boxplot(width=0.4, color="blue", alpha = 1, outlier.size = 1) +
  labs(x = "Preco", y = "") +
  scale_y_continuous(breaks = seq(16, 23, by = 1))
```

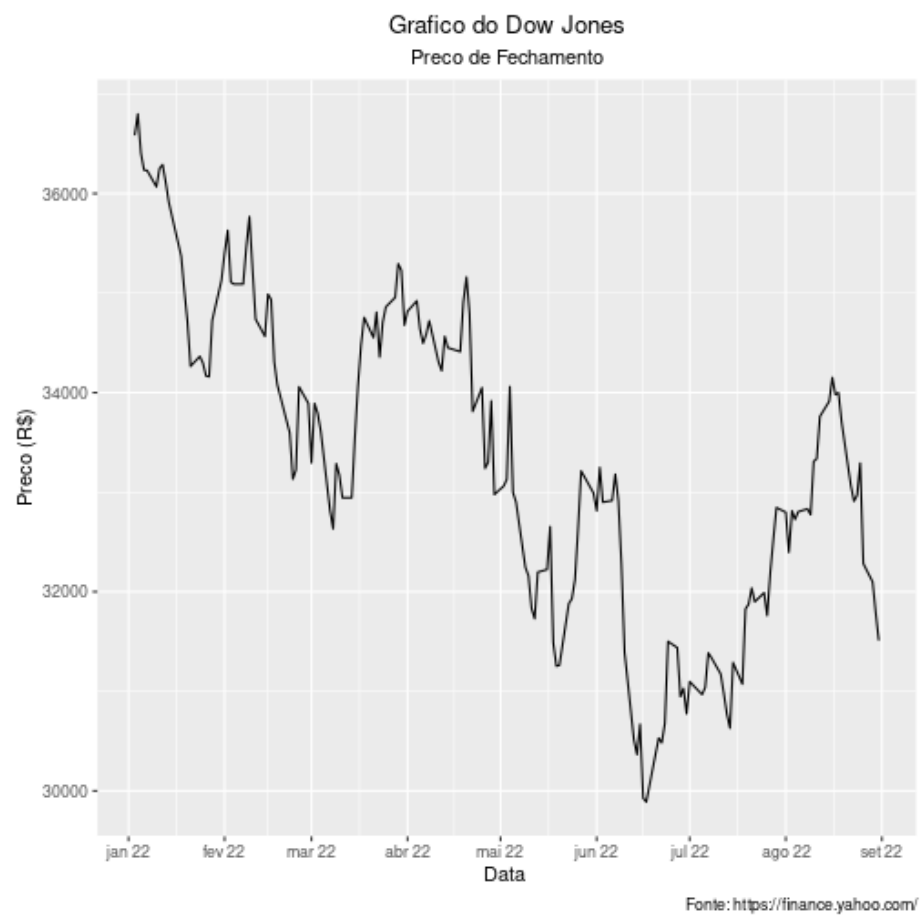


Figure 1: plot of chunk unnamed-chunk-16

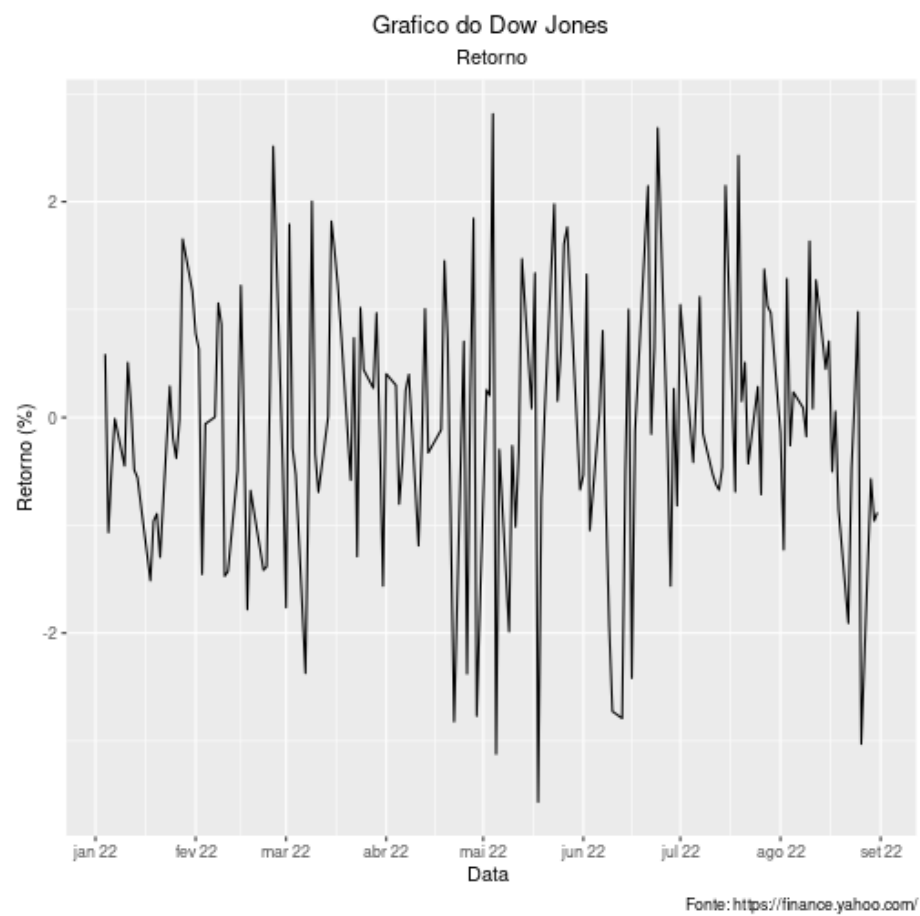


Figure 2: plot of chunk unnamed-chunk-18

```

z_preco_fechamento <- (preco_fechamento - mean(preco_fechamento)) / sd(preco_fechamento)

boxplot_z_pf <- ggplot(data = z_preco_fechamento, aes(x = "", y = z_preco_fechamento)) +
  geom_violin(trim = FALSE, color="goldenrod3") +
  geom_boxplot(width=0.4, color="red", alpha = 1, outlier.size = 1)+
  labs(x = "Preco Padronizado", y = "") +
  scale_y_continuous(breaks = seq(-5, 23, by = 1))

boxplots_pf <- ggarrange(boxplot_pf, boxplot_z_pf, ncol = 2, nrow = 1)
annotate_figure(boxplots_pf, top = text_grob("Boxplot/Violplot do Preco de Fechamento\ne Preco de Fechamento Padronizado"))

```

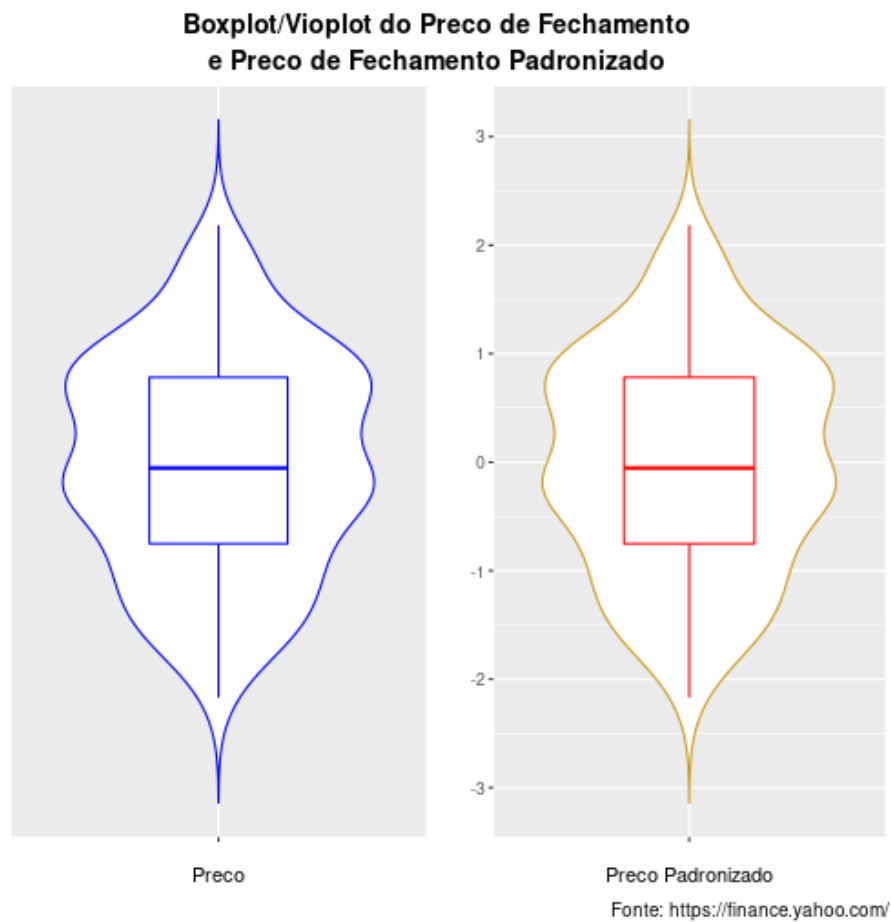


Figure 3: plot of chunk unnamed-chunk-19

```

boxplot_retorno <- ggplot(data = retorno_pf, aes(x = "", y = 100*retorno_pf)) + geom_violin

```

```

z_retorno_pf <- (retorno_pf - mean(retorno_pf))/(sd(retorno_pf))

boxplot_z_retorno_pf <- ggplot(data = z_retorno_pf, aes(x = "", y = z_retorno_pf)) + geom_violin()

boxplots_retorno <- ggarrange(boxplot_retorno, boxplot_z_retorno_pf, ncol = 2, nrow = 1)
annotate_figure(boxplots_retorno, top = text_grob("Boxplot/Violplot do Retorno\ne Retorno Padronizado"))

```

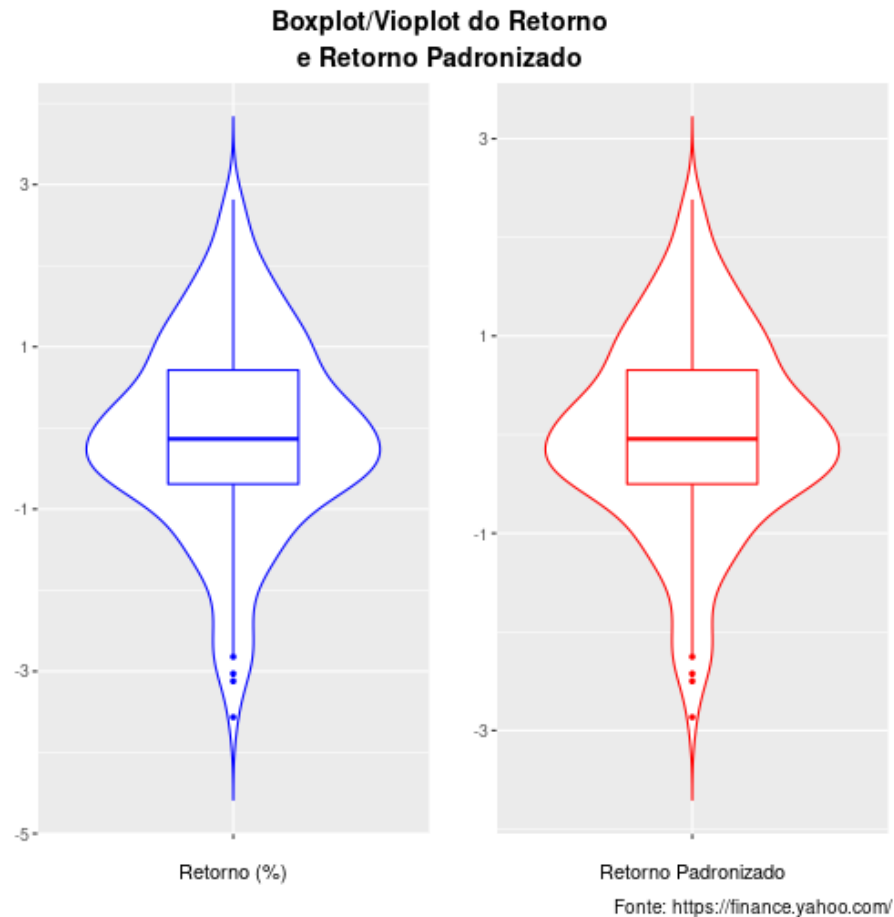


Figure 4: plot of chunk unnamed-chunk-19

#### 10. Histograma para dados originais (Preço de Fechamento e Retorno) e padronizados —

```

histograma_pf <- ggplot(data = preco_fechamento, aes(x = preco_fechamento)) + geom_histogram()

histograma_z_pf <- ggplot(data = z_preco_fechamento, aes(x = z_preco_fechamento)) + geom_histogram()

```



```

histogramas_pf <- ggarrange(histograma_pf, histograma_z_pf, ncol = 1, nrow = 2)
annotate_figure(histogramas_pf, top = text_grob("Histograma do Preço de Fechamento", color = "black"))

```

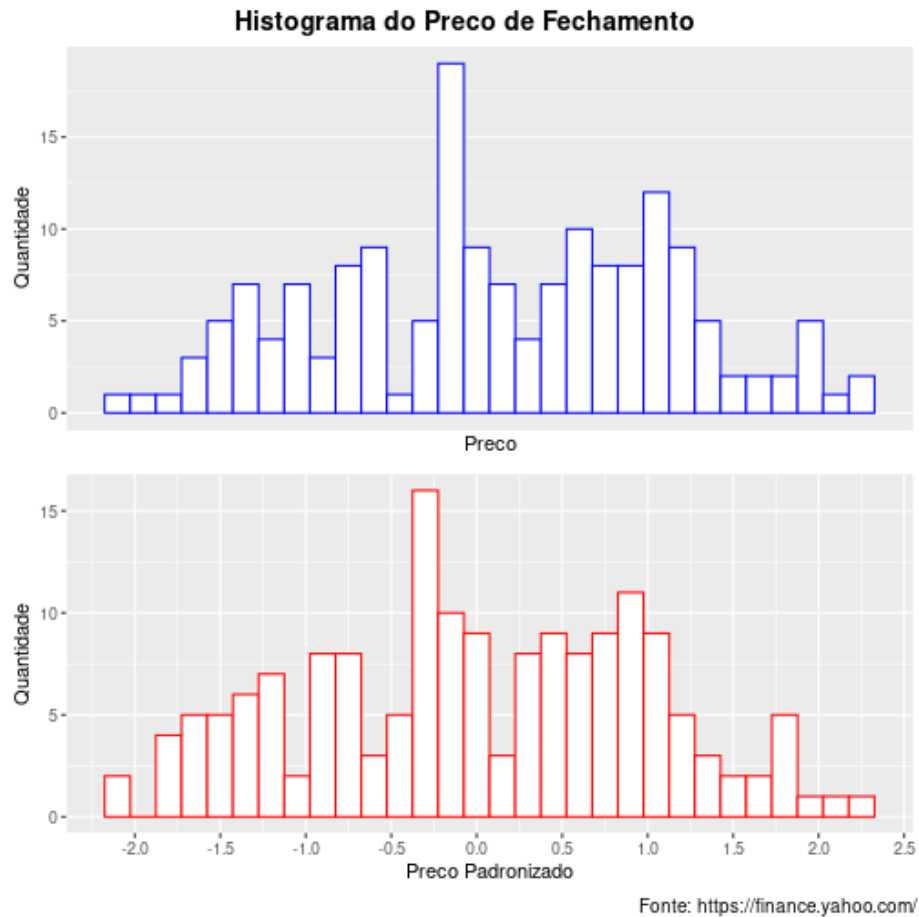


Figure 5: plot of chunk unnamed-chunk-20

```

histograma_retorno <- ggplot(data = retorno_pf, aes(x = 100*retorno_pf)) + geom_histogram(color = "black")
histograma_z_retorno <- ggplot(data = z_retorno_pf, aes(x = z_retorno_pf)) + geom_histogram(color = "black")
histogramas_retorno <- ggarrange(histograma_retorno, histograma_z_retorno, ncol = 1, nrow = 2)
annotate_figure(histogramas_retorno, top = text_grob("Histograma do Retorno", color = "black"))

```

## 11. QQPlot do retorno. —

```

qqplot_retorno <- ggplot(data = retorno_pf, aes(sample = 100*as.vector(retorno_pf))) + stat_qq()

```

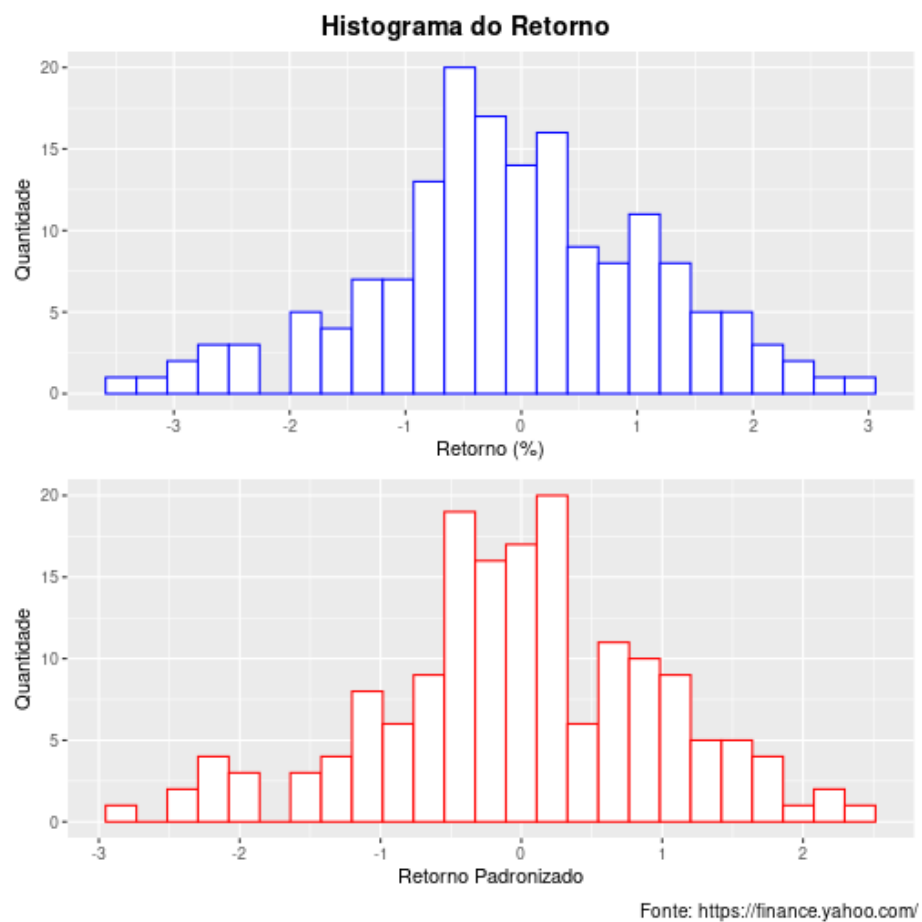


Figure 6: plot of chunk unnamed-chunk-20

12. QQLine do retorno (fazer junto com o QQPlot). —

```
histograma_retorno_qqplot <- ggplot(data = retorno_pf, aes(x = 100*retorno_pf)) +geom_histogram()

qqplot_linha_retorno <- ggplot(data = retorno_pf, aes(sample = 100*as.vector(retorno_pf))) +

plot_principal <- qqplot_linha_retorno

plot_para_inserir <- histograma_retorno_qqplot

plot.com.insercao <- ggdraw() + draw_plot(plot_principal) + draw_plot(plot_para_inserir, x = 
## Don't know how to automatically pick scale for object of type xts/zoo. Defaulting to cont
plot.com.insercao
```

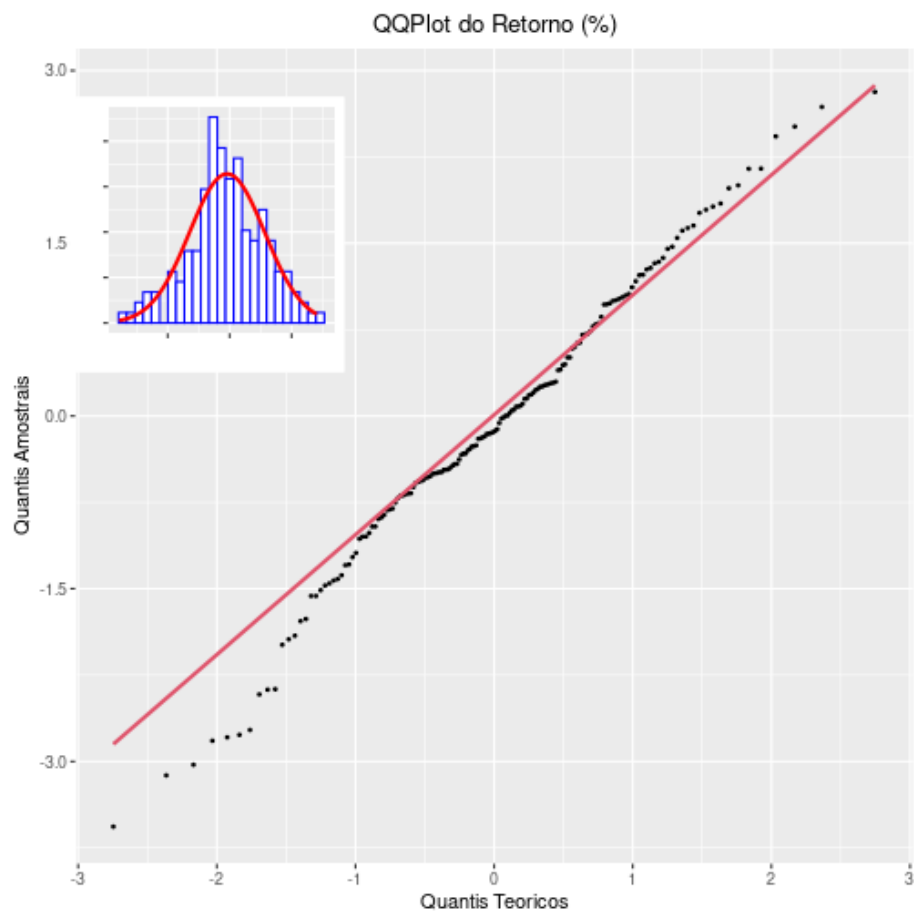


Figure 7: plot of chunk unnamed-chunk-22

```

library("knitr")
knit("./q1.rmd", output = "./q12.md")

##
##
## processing file: ./q1.rmd
## |
## ordinary text without R code
##
## |
## label: unnamed-chunk-24
## |
## ordinary text without R code
##
## |
## label: unnamed-chunk-25
## |
## ordinary text without R code
##
## |
## label: unnamed-chunk-26
## |
## ordinary text without R code
##
## |
## label: unnamed-chunk-27
## |
## ordinary text without R code
##
## |
## label: unnamed-chunk-28
## |
## ordinary text without R code
##
## |
## label: unnamed-chunk-29
## |
## ordinary text without R code
##
## |
## label: unnamed-chunk-30
## |
## ordinary text without R code
##
## |
## label: unnamed-chunk-31

```

```

## |
## ordinary text without R code
##
## |
## label: unnamed-chunk-32
## |
## ordinary text without R code
##
## |
## label: unnamed-chunk-33
## |
## ordinary text without R code
##
## |
## label: unnamed-chunk-34
## |
## inline R code fragments
##
## |
## label: unnamed-chunk-35
## |
## ordinary text without R code
##
## |
## label: unnamed-chunk-36
## |
## ordinary text without R code
##
## |
## label: unnamed-chunk-37
## |
## ordinary text without R code
##
## |
## label: unnamed-chunk-38
## |
## ordinary text without R code
##
## |
## label: unnamed-chunk-39
##
## |
## ordinary text without R code
##
## |
## label: unnamed-chunk-40

```

```

## |
## ordinary text without R code
##
## |
## label: unnamed-chunk-41
##
## |
## ordinary text without R code
##
## |
## label: unnamed-chunk-42
##
## |
## ordinary text without R code
##
## |
## label: unnamed-chunk-43
##
## |
## ordinary text without R code
##
## |
## label: unnamed-chunk-44
##
## |
## ordinary text without R code
##
## |
## label: unnamed-chunk-45
##
## |
## ordinary text without R code
##
## |
## label: unnamed-chunk-46
## output file: ./q12.md
## [1] "./q12.md"

```