Crypto News!

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Importazione delle librerie necessarie

In primo luogo, per eseguire il nostro processo di creazione di strategie di trading, dobbiamo importare le librerie necessarie nel nostro ambiente. In tutto questo processo, utilizzeremo alcune delle librerie finanziarie più popolari in R, ovvero Quantmod, TTR e Performance Analytics. Utilizzando la funzione library in R, possiamo importare i nostri pacchetti richiesti.

```
library(quantmod)
library(PerformanceAnalytics)
library(TTR)
```

Passaggio 2: Estrazione dei dati da Yahoo e Plotting di base

durante tutto il nostro processo, lavoreremo con i dati del prezzo delle cryptovalute Bitcoin, Ethereum, Binance, Cardano e XRP. Estraiamo i dati di queste valute da Yahoo in R.

```
getSymbols("BTC-USD", src = "yahoo", from = "2019-01-01")
```

```
## [1] "BTC-USD"
```

```
getSymbols("ETH-USD", src = "yahoo", from = "2019-01-01")
```

```
## [1] "ETH-USD"
```

```
getSymbols("BNB-USD", src = "yahoo", from = "2019-01-01")
```

```
## [1] "BNB-USD"
```

```
getSymbols("ADA-USD", src = "yahoo", from = "2019-01-01")
```

```
## [1] "ADA-USD"
```

```
getSymbols("XRP-USD", src = "yahoo", from = "2019-01-01")
```

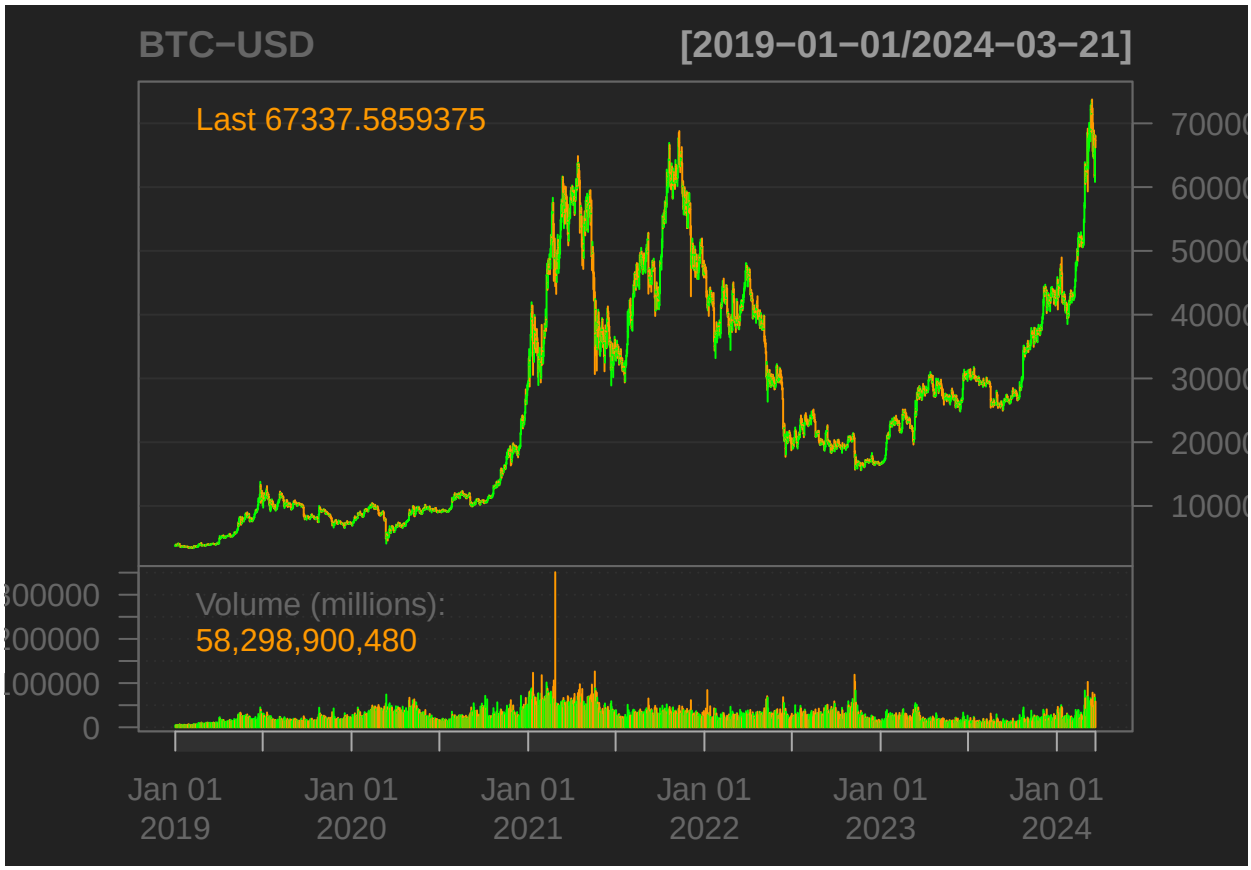
```
## [1] "XRP-USD"
```

```
getSymbols("SOL-USD", src = "yahoo", from = "2020-01-01")
```

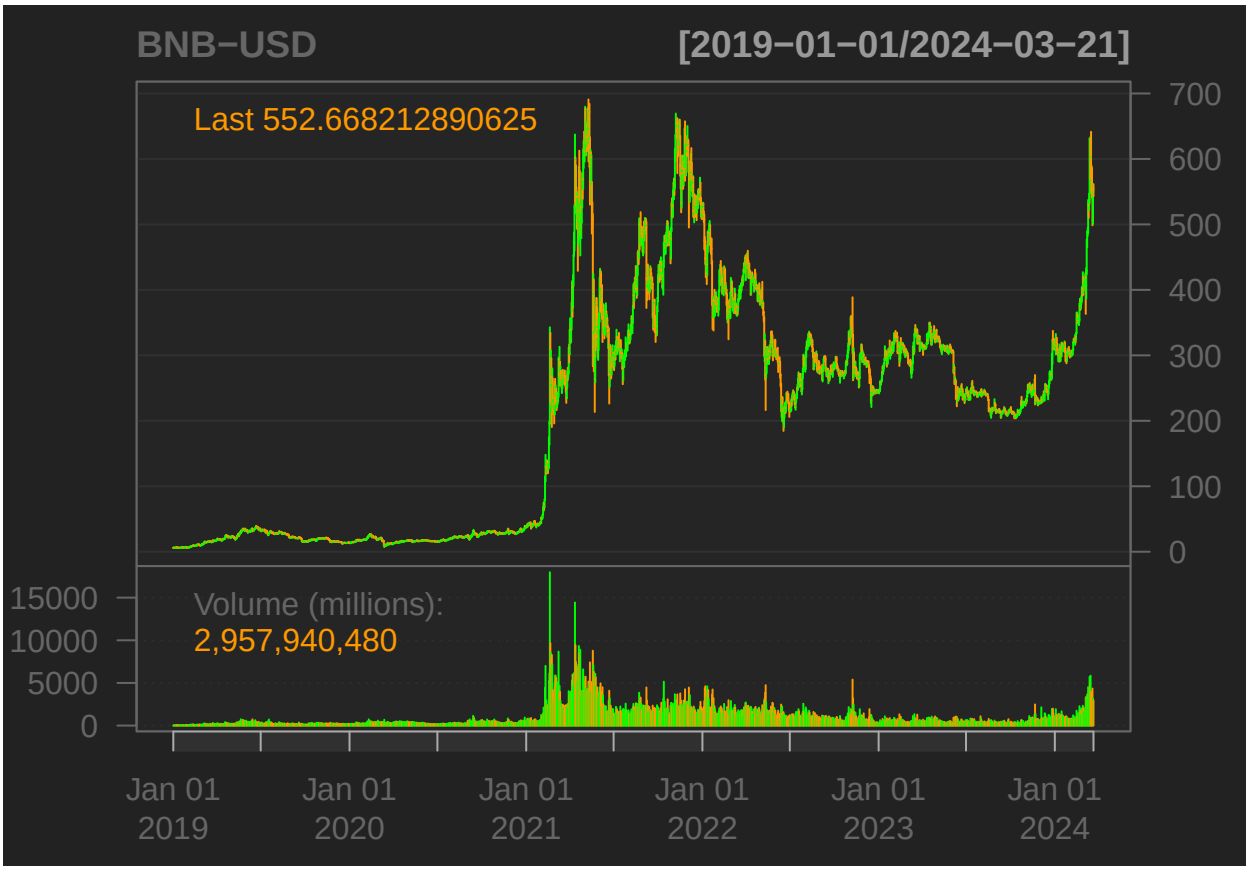
```
## [1] "SOL-USD"
```

Ora facciamo un po' di visualizzazione dei nostri dati estratti! Il seguente codice produce un grafico a barre finanziario dei prezzi delle azioni insieme al volume.

```
barChart(`BTC-USD`, theme = chartTheme("black"))
```

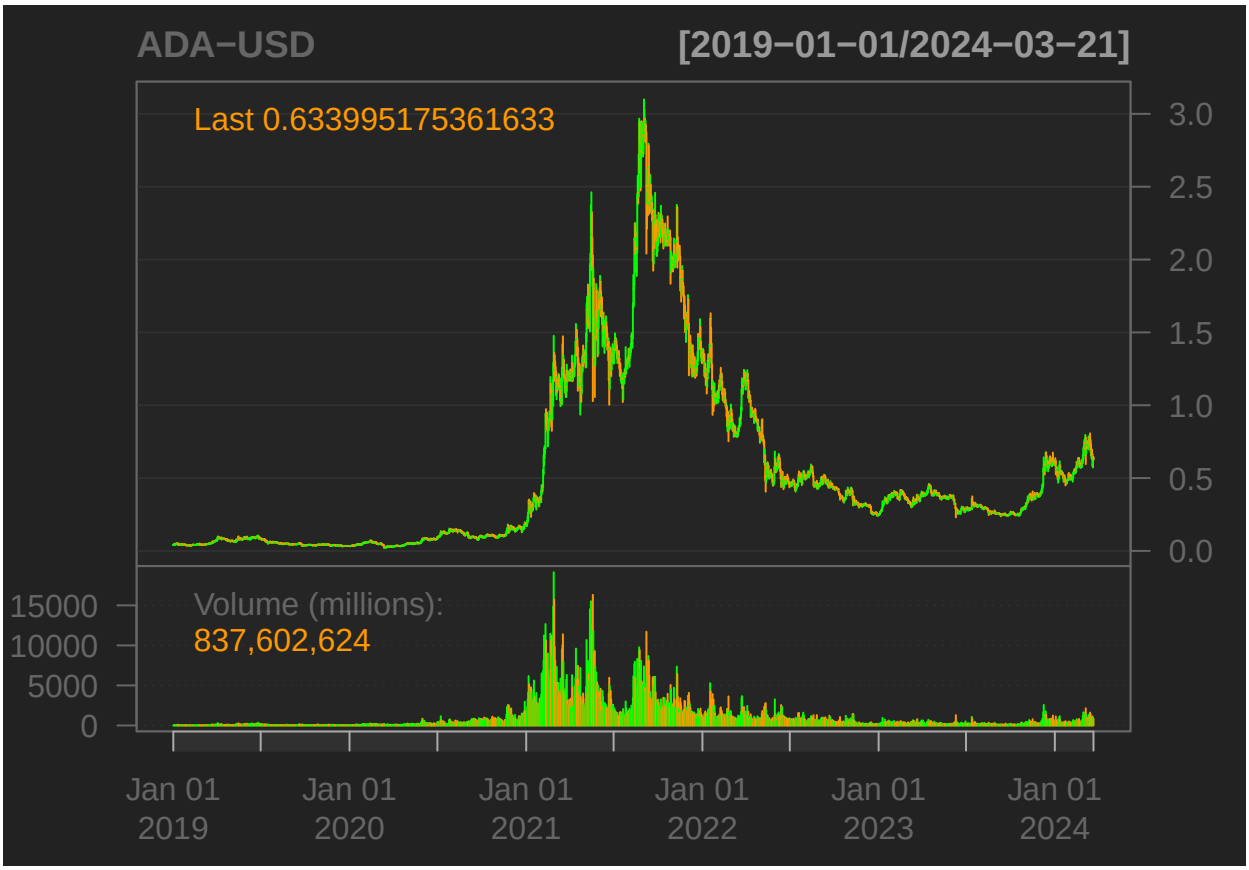



```
barChart(`BNB-USD`, theme = chartTheme("black"))
```



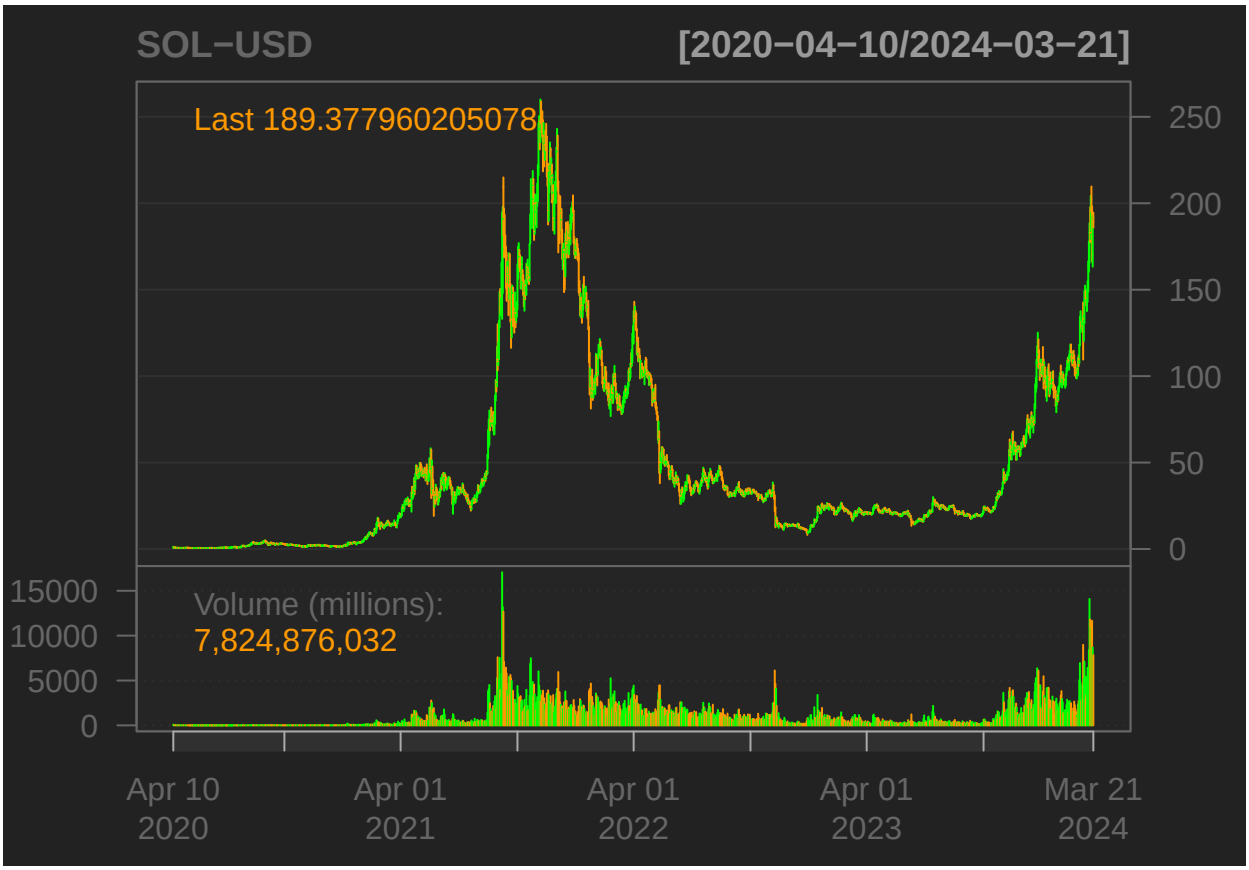

```
barChart(`ETH-USD`, theme = chartTheme("black"))
```


```
barChart(`ADA-USD`, theme = chartTheme("black"))
```




```
barChart(`XRP-USD`, theme = chartTheme("black"))
```


```
barChart(`SOL-USD`, theme = chartTheme("black"))
```



Creazione di indicatori tecnici

Ci sono molti indicatori tecnici utilizzati per l'analisi finanziaria ma, per la nostra analisi, utilizzeremo e creeremo sei dei più famosi indicatori tecnici, ovvero: Media mobile semplice (SMA), Parabolic Stop And Reverse (SAR), Indice del canale delle materie prime (CCI), Tasso di variazione (ROC), Indice del momento stocastico (SMI) e infine Williams %R. Facciamolo!. Nella nuova dimensione di questi

Media mobile semplice (SMA):

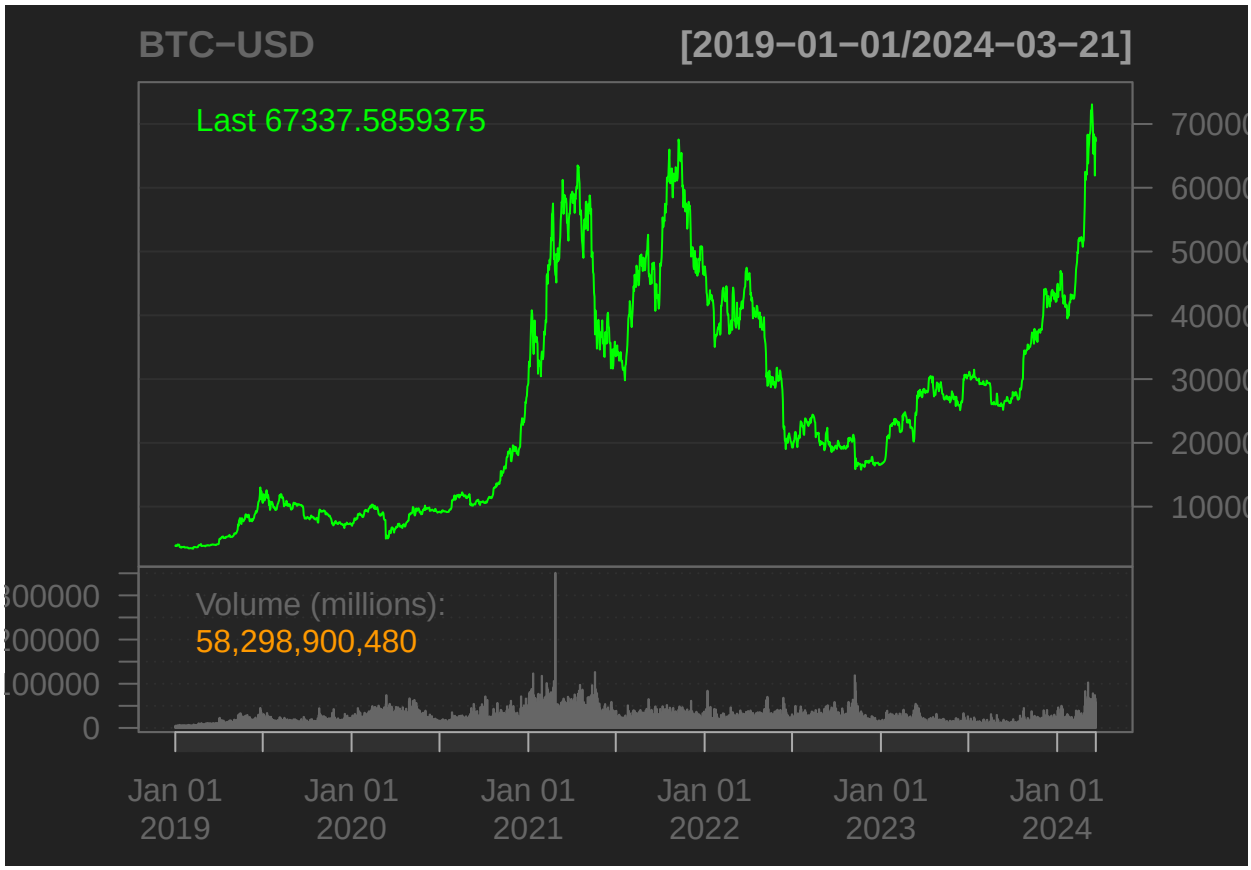
L'intervallo di tempo standard che prenderemo è di 20 giorni SMA e 50 giorni SMA. Ma non ci sono restrizioni nell'uso di qualsiasi intervallo di tempo.

Il seguente codice calcolerà la SMA di tre aziende per 20 giorni e 50 giorni insieme ad un grafico:

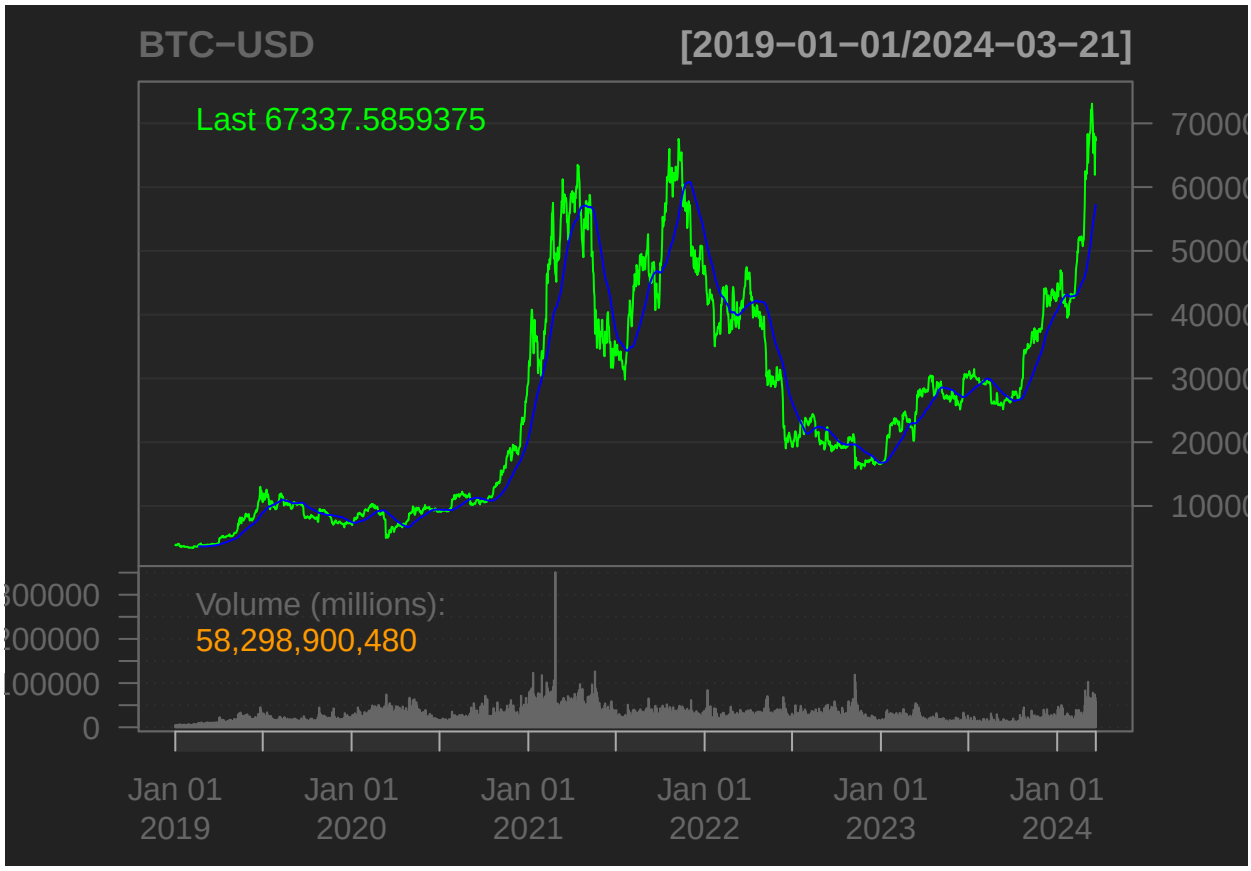
```
BTC <- `BTC-USD`
ETH <- `ETH-USD`
BNB <- `BNB-USD`
ADA <- `ADA-USD`
XRP <- `XRP-USD`
SOL <- `SOL-USD`
```

```
# Replace NAs with the mean of the column
BTC$`BTC-USD.Close`[is.na(BTC$`BTC-USD.Close`)] <- mean(BTC$`BTC-USD.Close`, na.rm = TRUE)

# Calculate moving averages
sma50_btc <- SMA(BTC$`BTC-USD.Close`, n = 50)
sma100_btc <- SMA(BTC$`BTC-USD.Close`, n = 100)
```

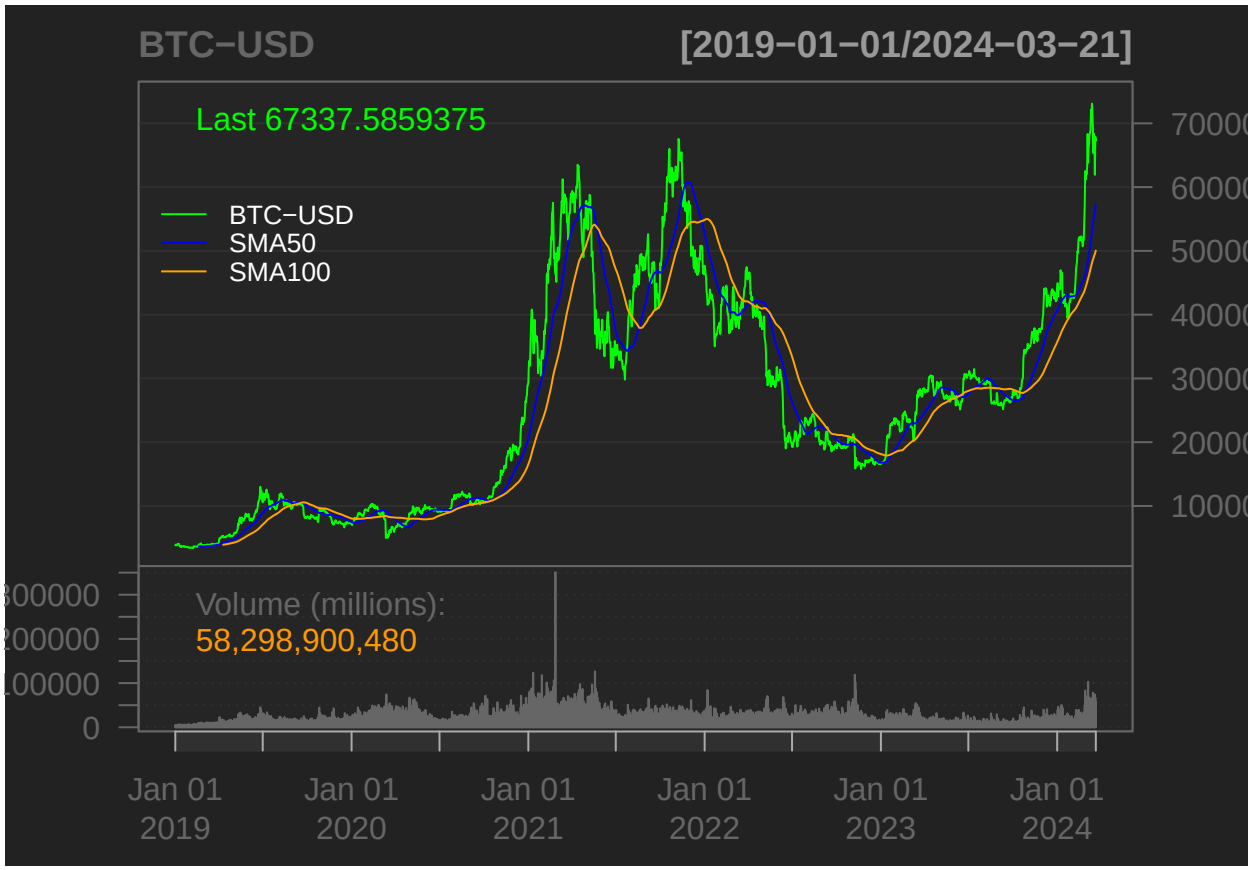
```
 # Plot the data
lineChart(`BTC-USD`, theme = chartTheme("black"))
```



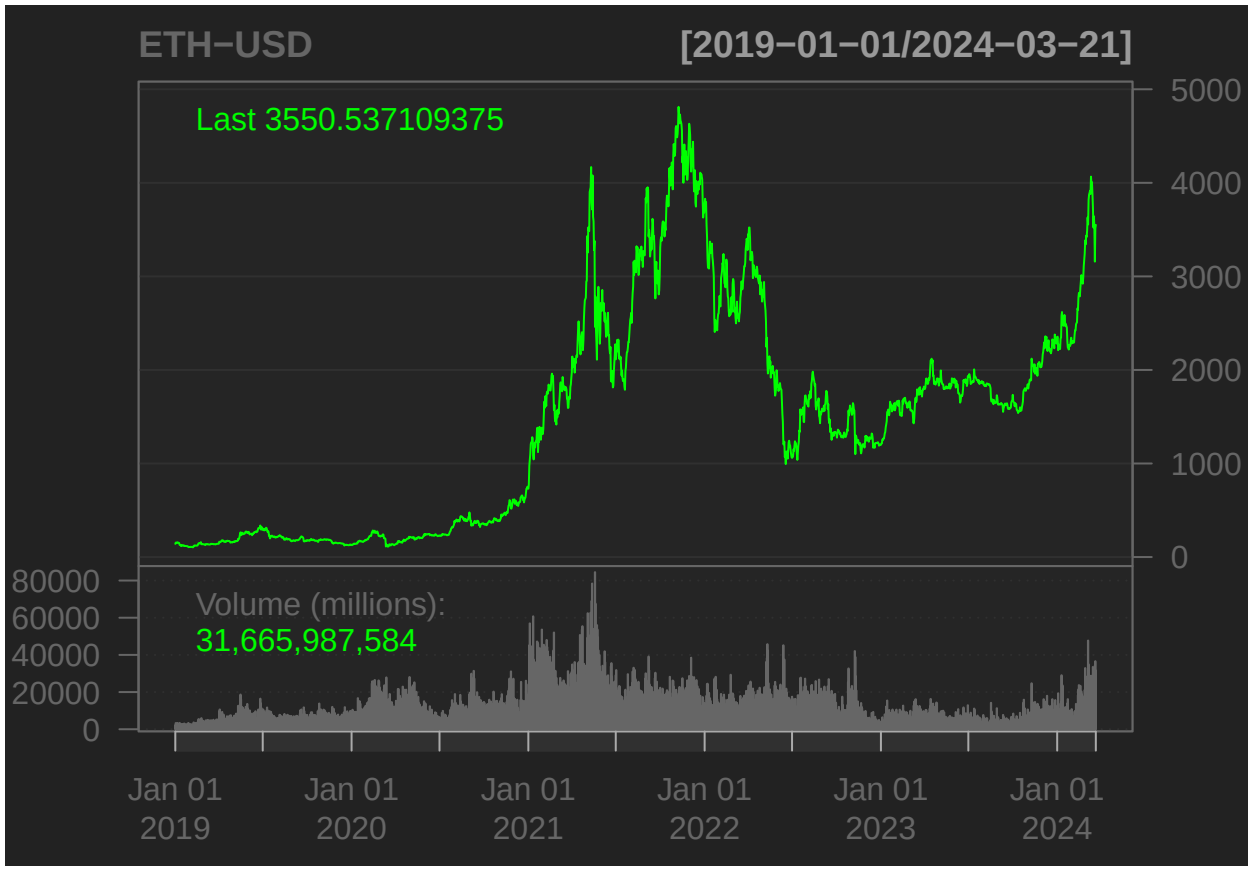

```
addSMA(n = 50, col = "blue")
```



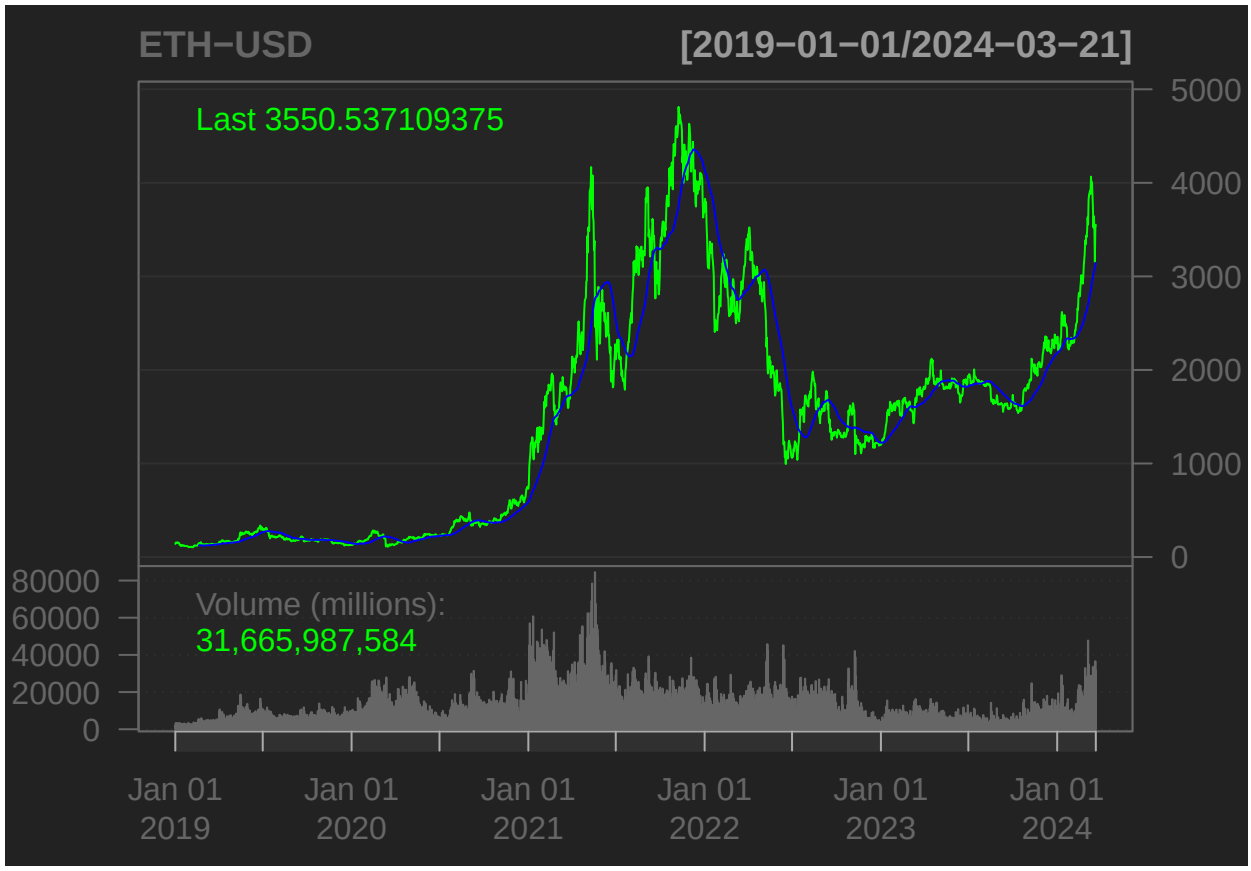

```
addSMA(n = 100, col = "orange")

# Add legend
legend("left",
  col = c("green", "blue", "orange"),
  legend = c("BTC-USD", "SMA50", "SMA100"), lty = 1, bty = "n",
  text.col = "white", cex = 0.8
)
```



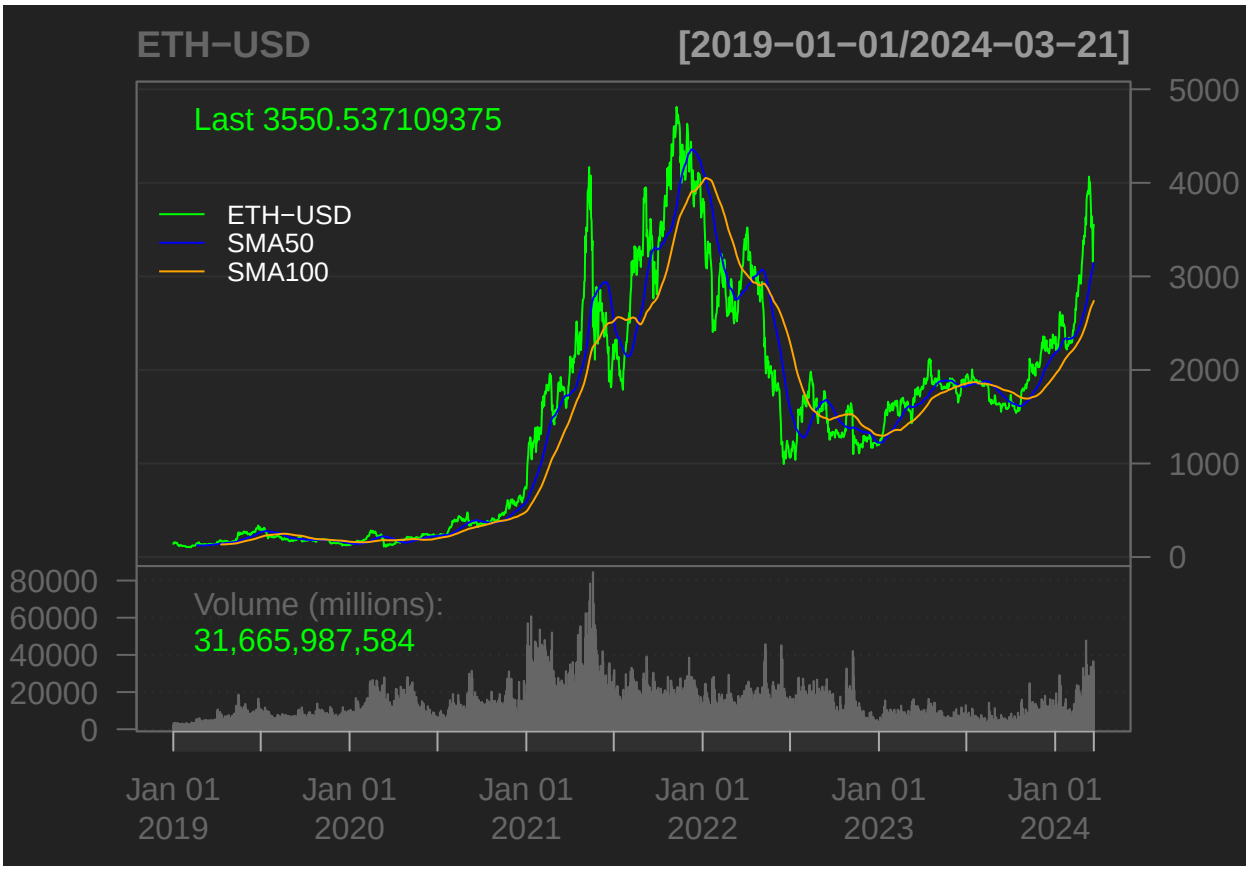

```
# 2. ETH-USD
ETH$`ETH-USD.Close`[is.na(ETH$`-USD.Close`)] <- mean(ETH$`ETH-USD.Close`, na.rm = TRUE)

sma50_btc <- SMA(ETH$`ETH-USD.Close`, n = 50)
sma100_btc <- SMA(ETH$`ETH-USD.Close`, n = 100)
lineChart(`ETH-USD`, theme = chartTheme("black"))
```




```
addSMA(n = 50, col = "blue")
```




```
addSMA(n = 100, col = "orange")
legend("left",
  col = c("green", "blue", "orange"),
  legend = c("ETH-USD", "SMA50", "SMA100"), lty = 1, bty = "n",
  text.col = "white", cex = 0.8
)
```

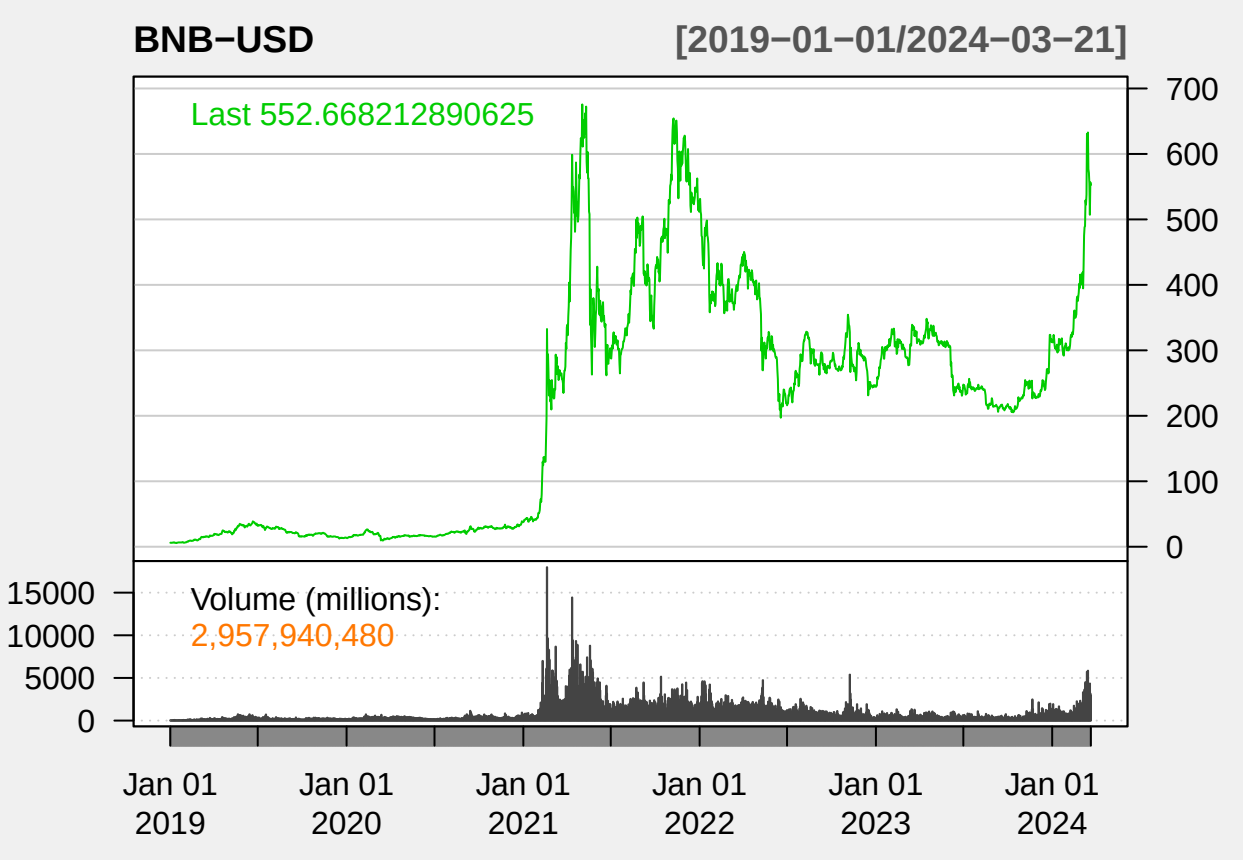



```
sma50_btc <- SMA(ADA$`ADA-USD.Close`, n = 50)
sma100_btc <- SMA(ADA$`ADA-USD.Close`, n = 100)
lineChart(`ADA-USD`, theme = chartTheme("black"))
```

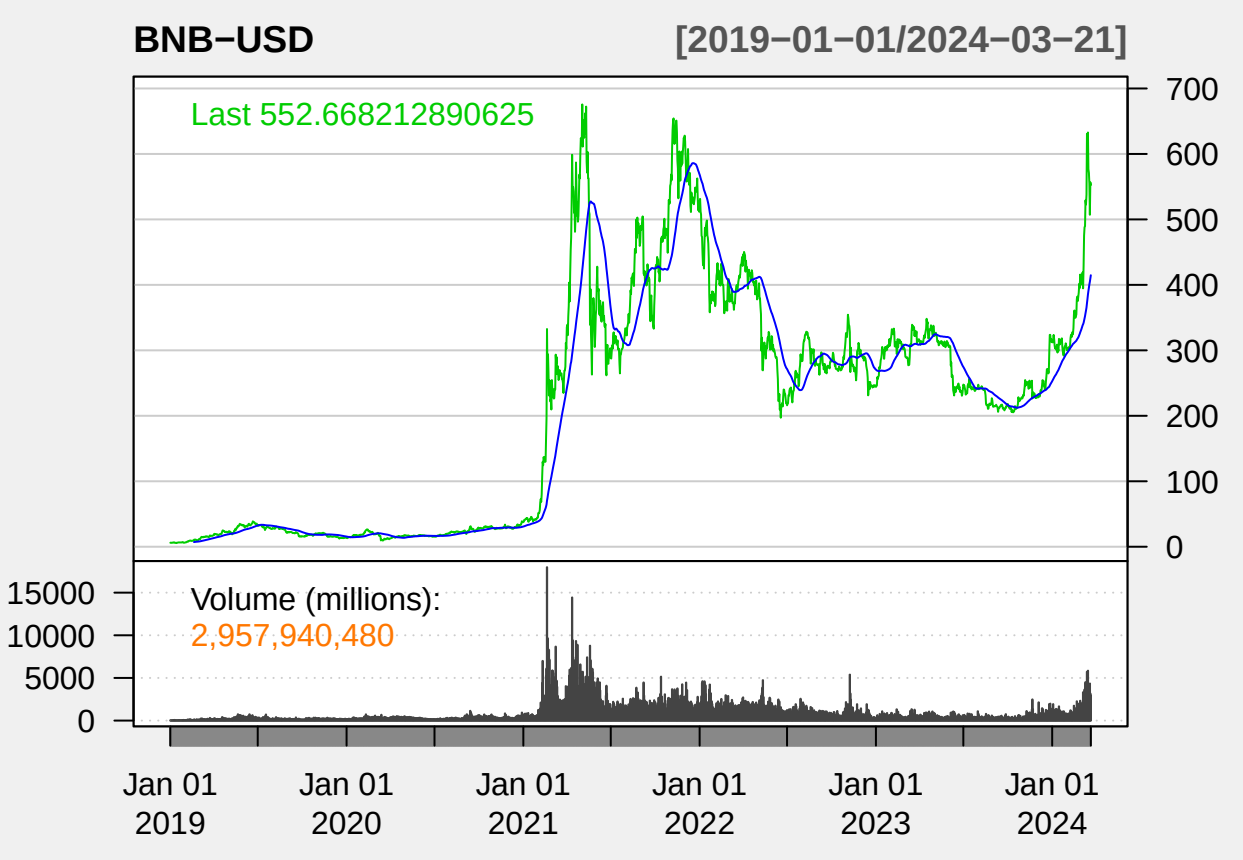

```
addSMA(n = 50, col = "blue")
```


```
addSMA(n = 100, col = "orange")
legend("left",
  col = c("green", "blue", "orange"),
  legend = c("ADA-USD", "SMA50", "SMA100"), lty = 1, bty = "n",
  text.col = "white", cex = 0.8
)
```

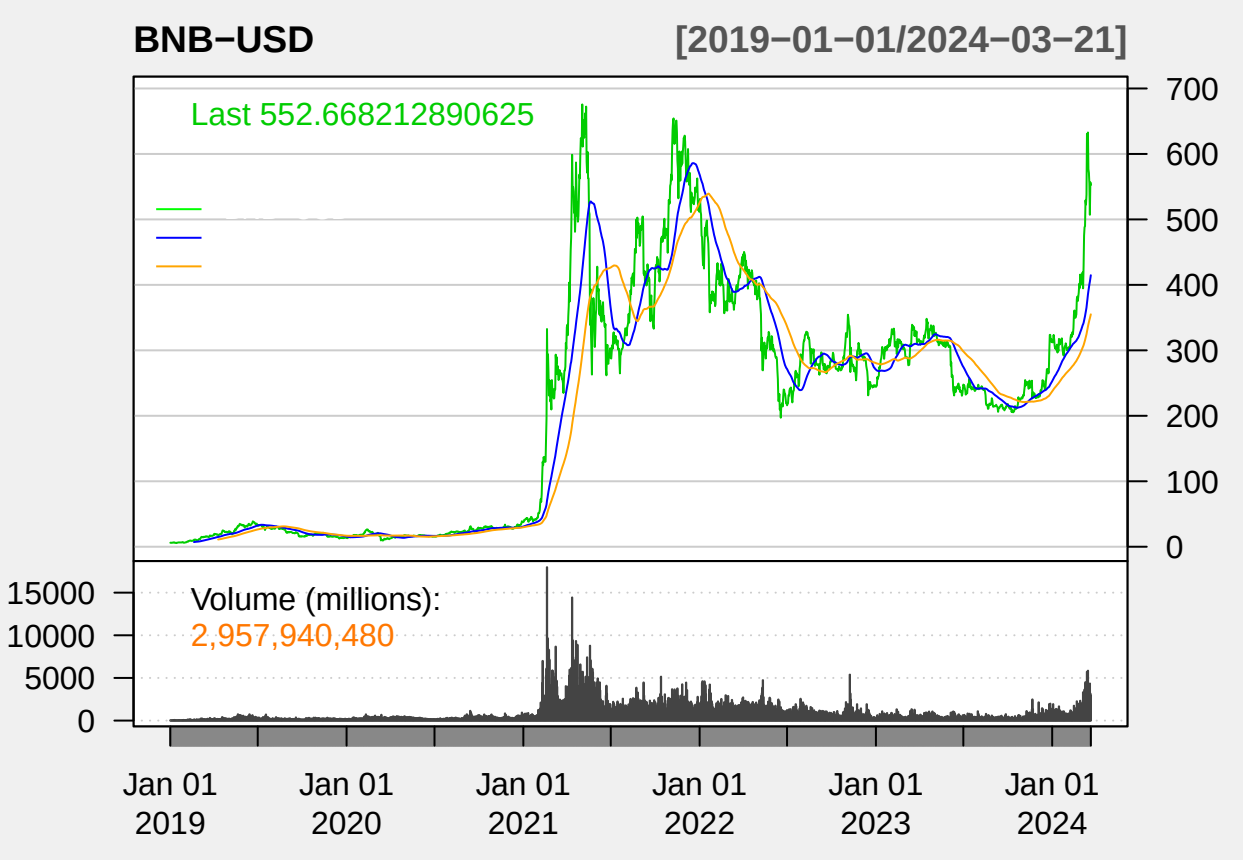

```
sma50_btc <- SMA(BNB$`BNB-USD.Close`, n = 50)
sma100_btc <- SMA(BNB$`BNB-USD.Close`, n = 100)
lineChart(`BNB-USD`, theme = chartTheme("white"))
```




```
addSMA(n = 50, col = "blue")
```




```
addSMA(n = 100, col = "orange")
legend("left",
  col = c("green", "blue", "orange"),
  legend = c("BNB-USD", "SMA50", "SMA100"), lty = 1, bty = "n",
  text.col = "white", cex = 0.8
)
```

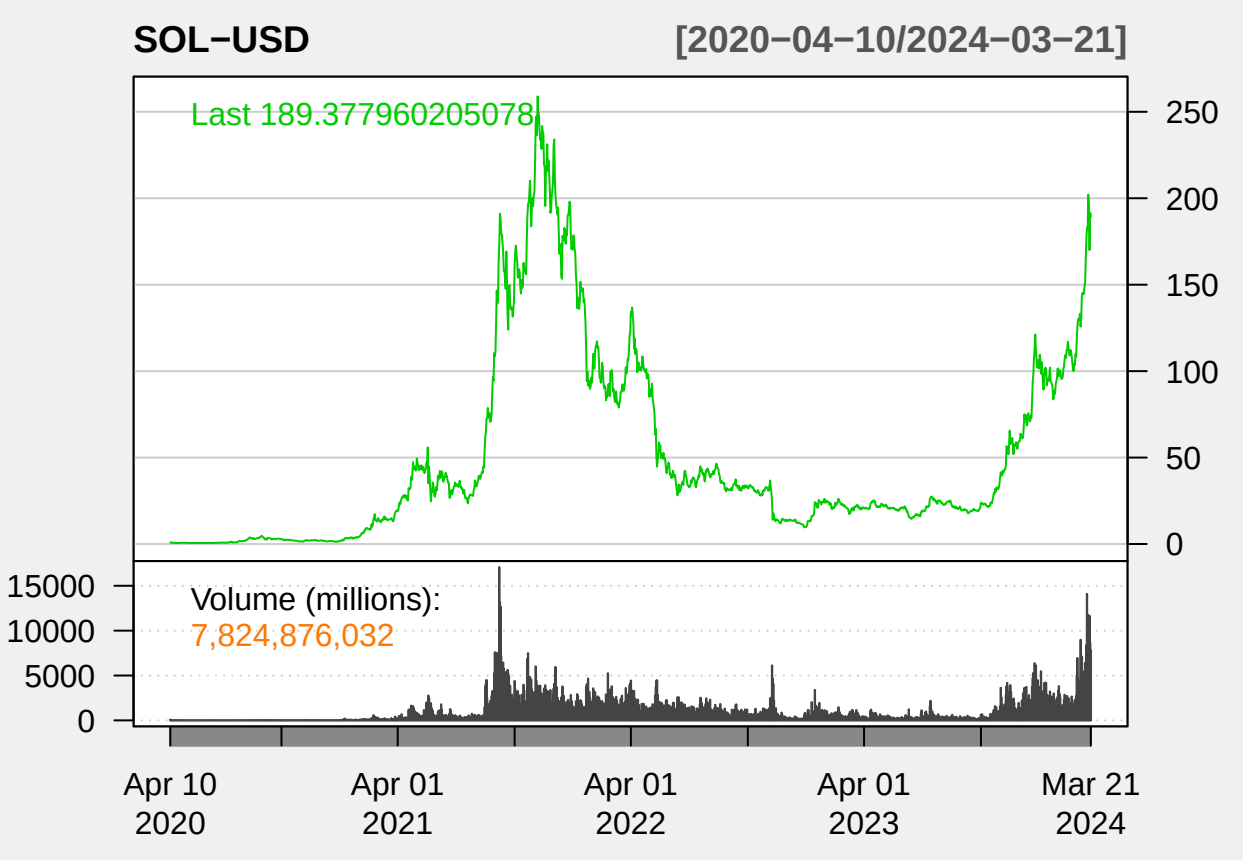



```
sma50_btc <- SMA(XRP$`XRP-USD.Close`, n = 50)
sma100_btc <- SMA(XRP$`XRP-USD.Close`, n = 100)
lineChart(`XRP-USD`, theme = chartTheme("black"))
```

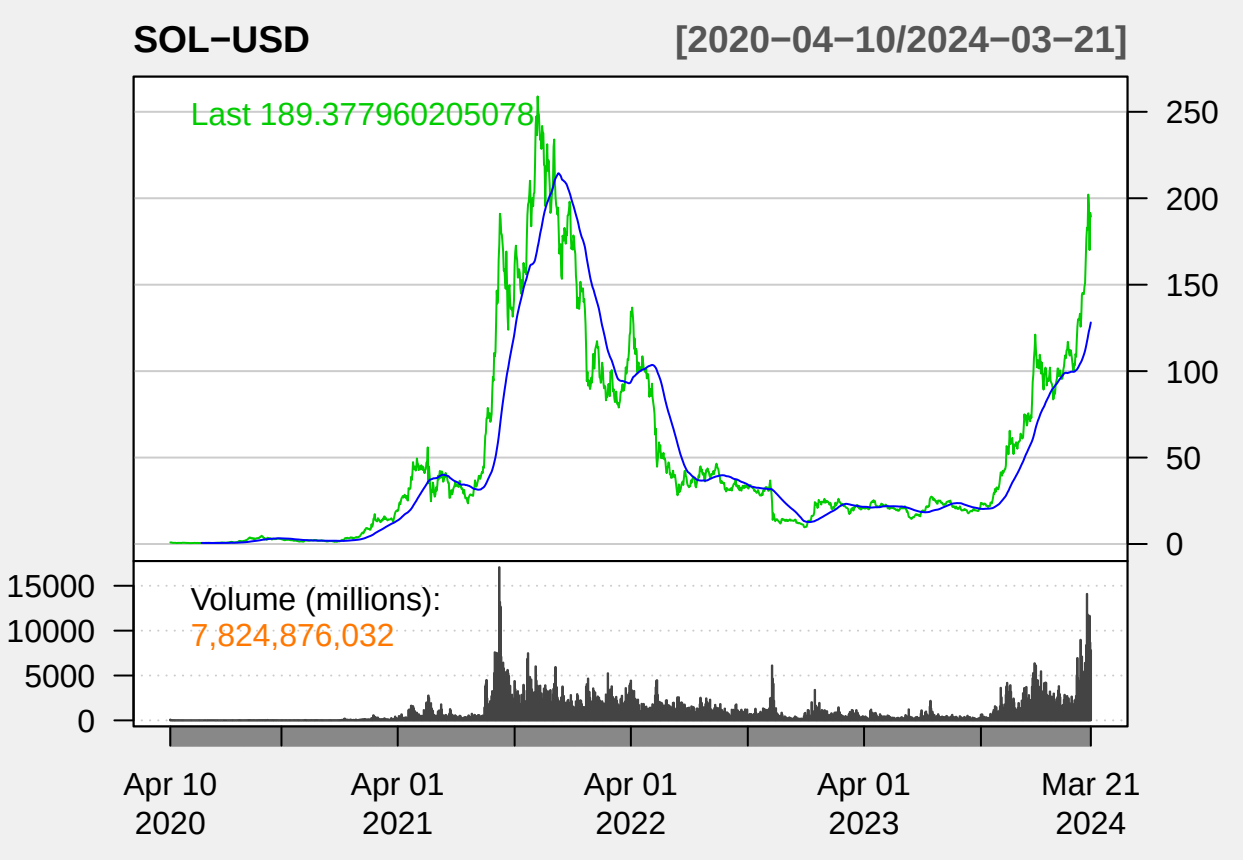

```
addSMA(n = 50, col = "blue")
```


```
addSMA(n = 100, col = "orange")
legend("left",
  col = c("green", "blue", "orange"),
  legend = c("BNB-USD", "SMA50", "SMA100"), lty = 1, bty = "n",
  text.col = "white", cex = 0.8
)
```

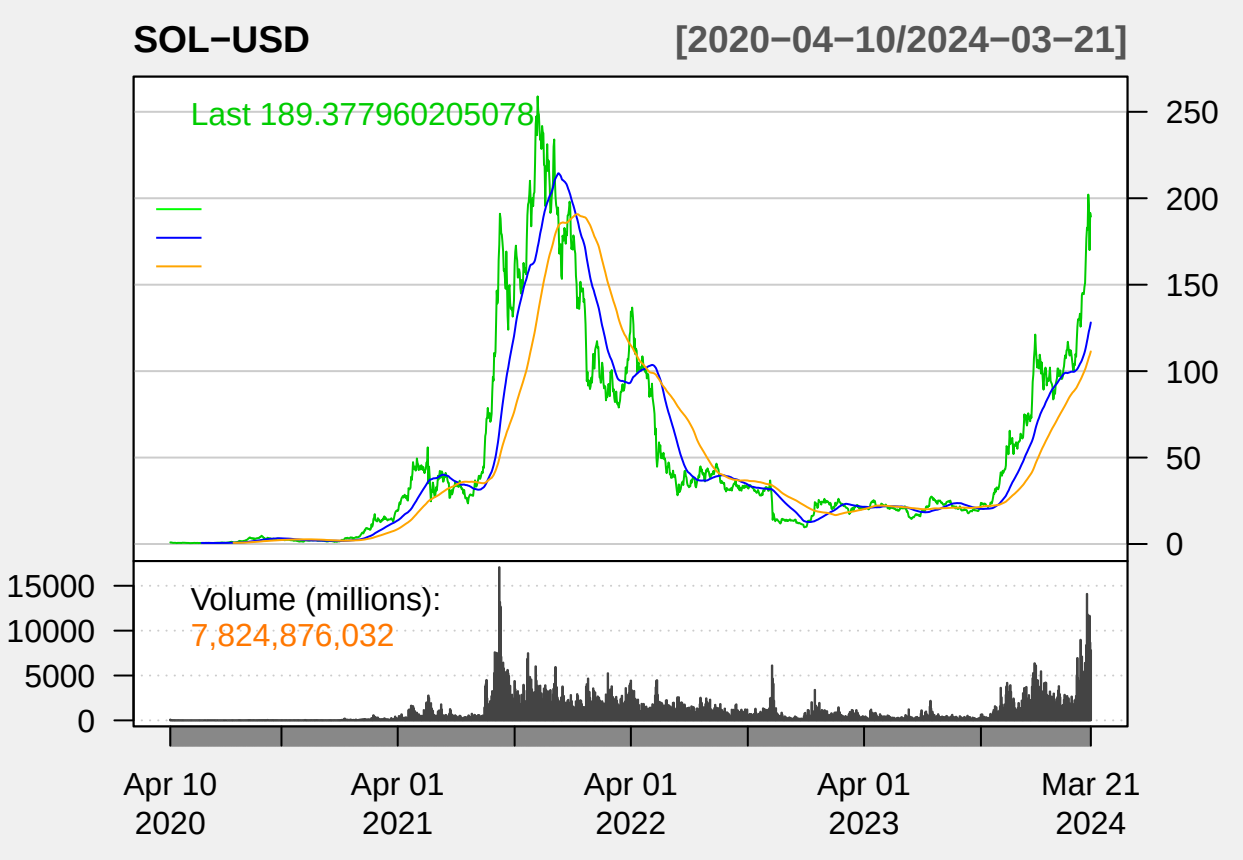

```
sma50_btc <- SMA(SOL$`SOL-USD.Close`, n = 50)
sma100_btc <- SMA(SOL$`SOL-USD.Close`, n = 100)
lineChart(`SOL-USD`, theme = chartTheme("white"))
```




```
addSMA(n = 50, col = "blue")
```




```
addSMA(n = 100, col = "orange")
legend("left",
  col = c("green", "blue", "orange"),
  legend = c("SOL-USD", "SMA50", "SMA100"), lty = 1, bty = "n",
  text.col = "white", cex = 0.8
)
```

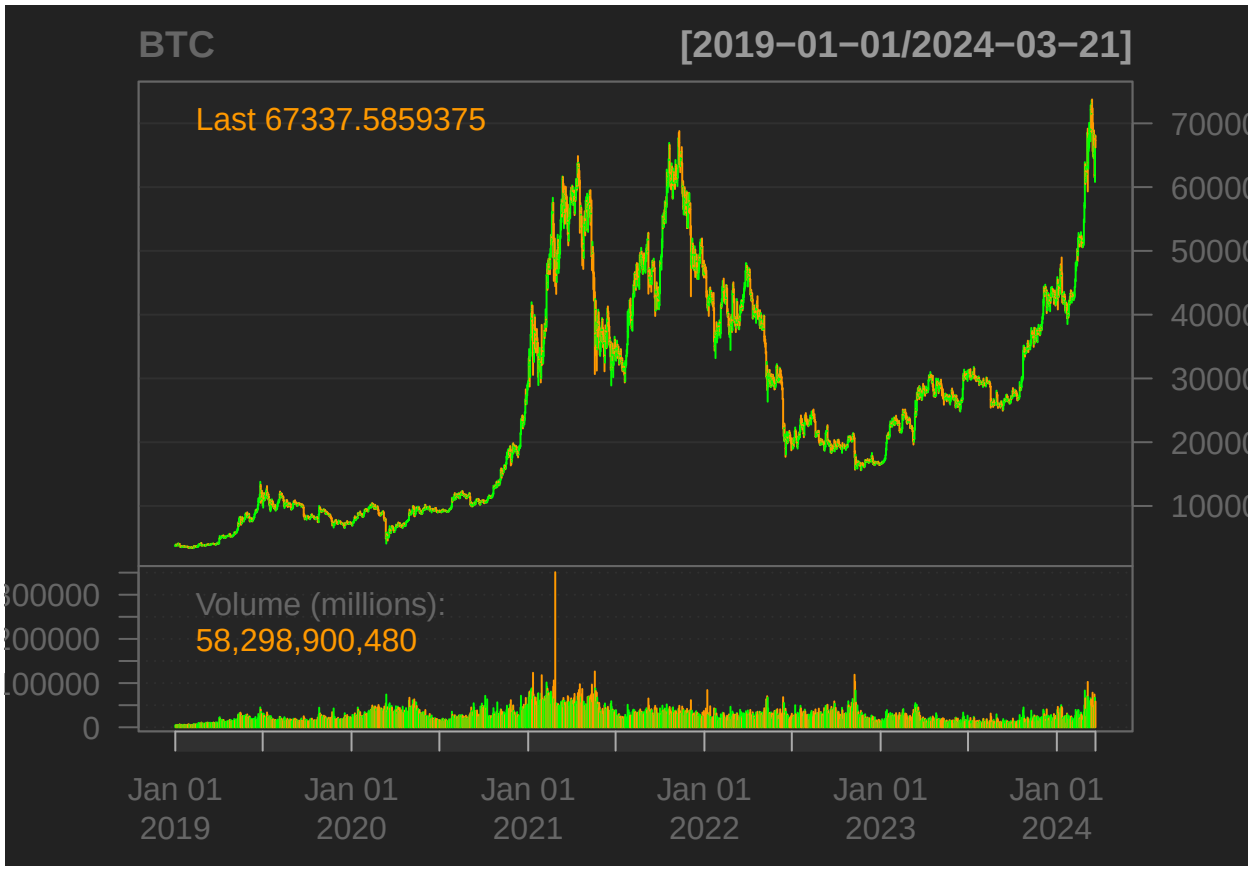


Indice del Canale delle Materie Prime (CCI):

Per calcolare il CCI, dobbiamo considerare i prezzi giornalieri di massimo, minimo e chiusura delle aziende insieme a un periodo di tempo specificato e un valore costante. In questo passaggio, prenderemo 20 giorni come periodo di tempo e 0,015 come valore costante.

Il seguente codice calcolerà il CCI delle aziende insieme a un grafico:

```
# 1.BTC
cci_BTC <- CCI(HLC(BTC), n = 20, c = 0.015)
barChart(BTC, theme = "black")
```

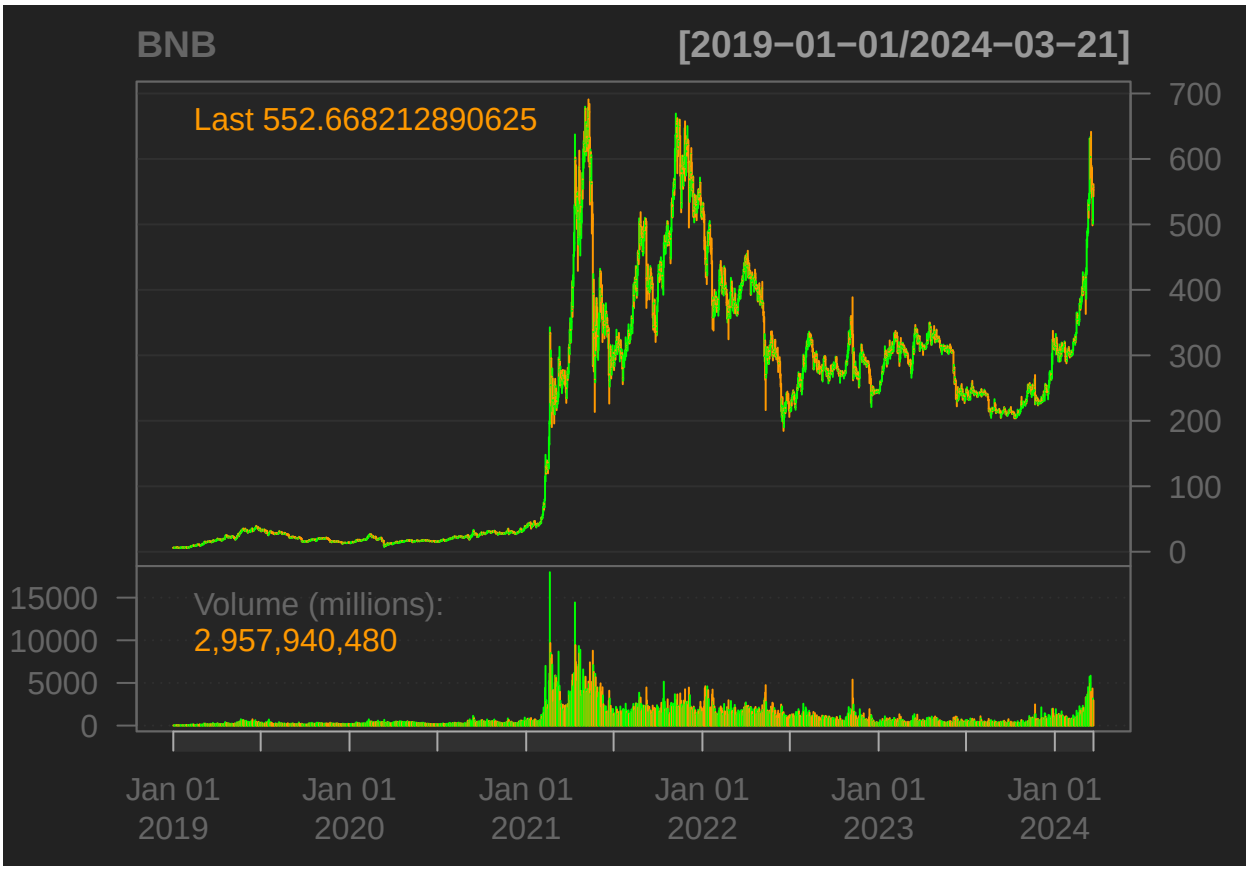



```
addCCI(n = 20, c = 0.015)
```

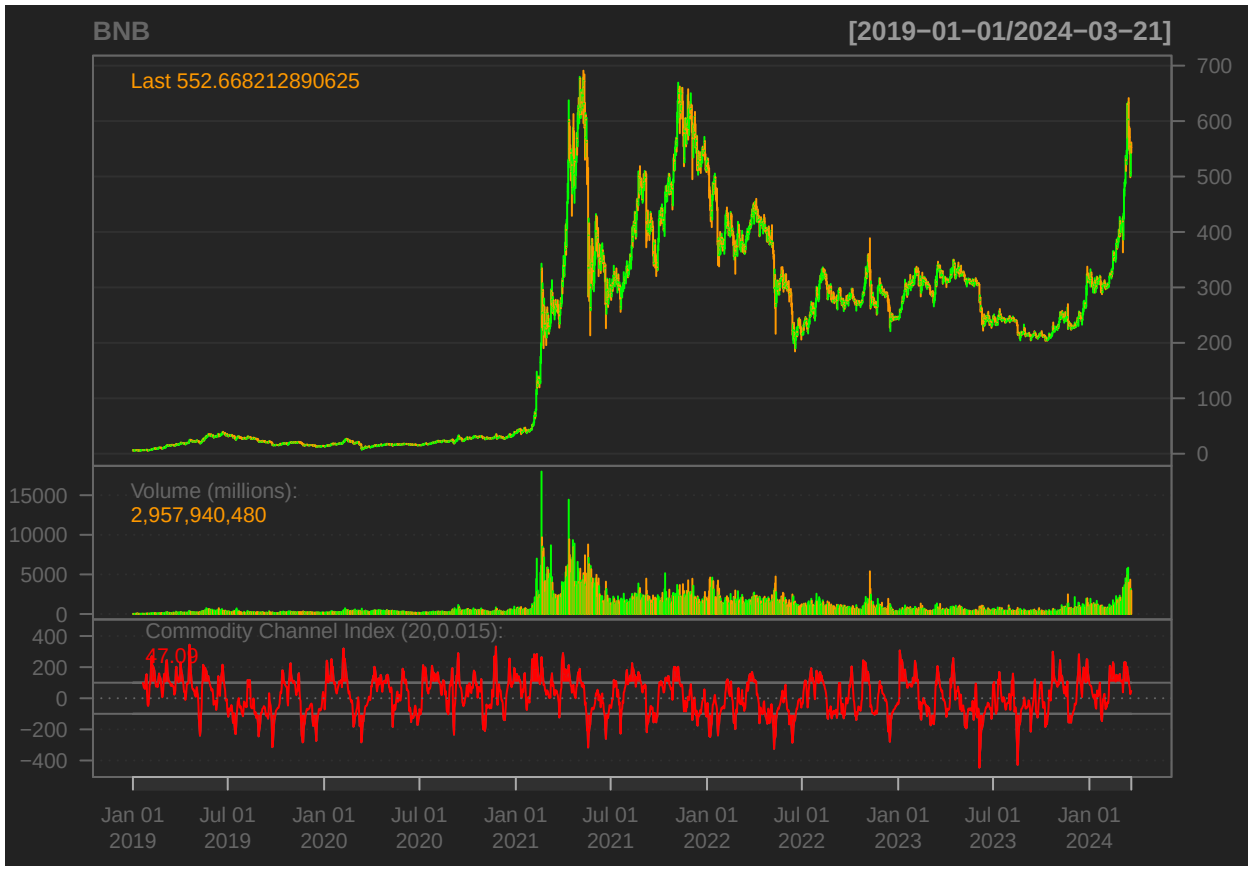

```
# 2.ETH
cci_eth <- CCI(HLC(ETH), n = 20, c = 0.015)
barChart(ETH, theme = "black")
```


```
addCCI(n = 20, c = 0.015)
```

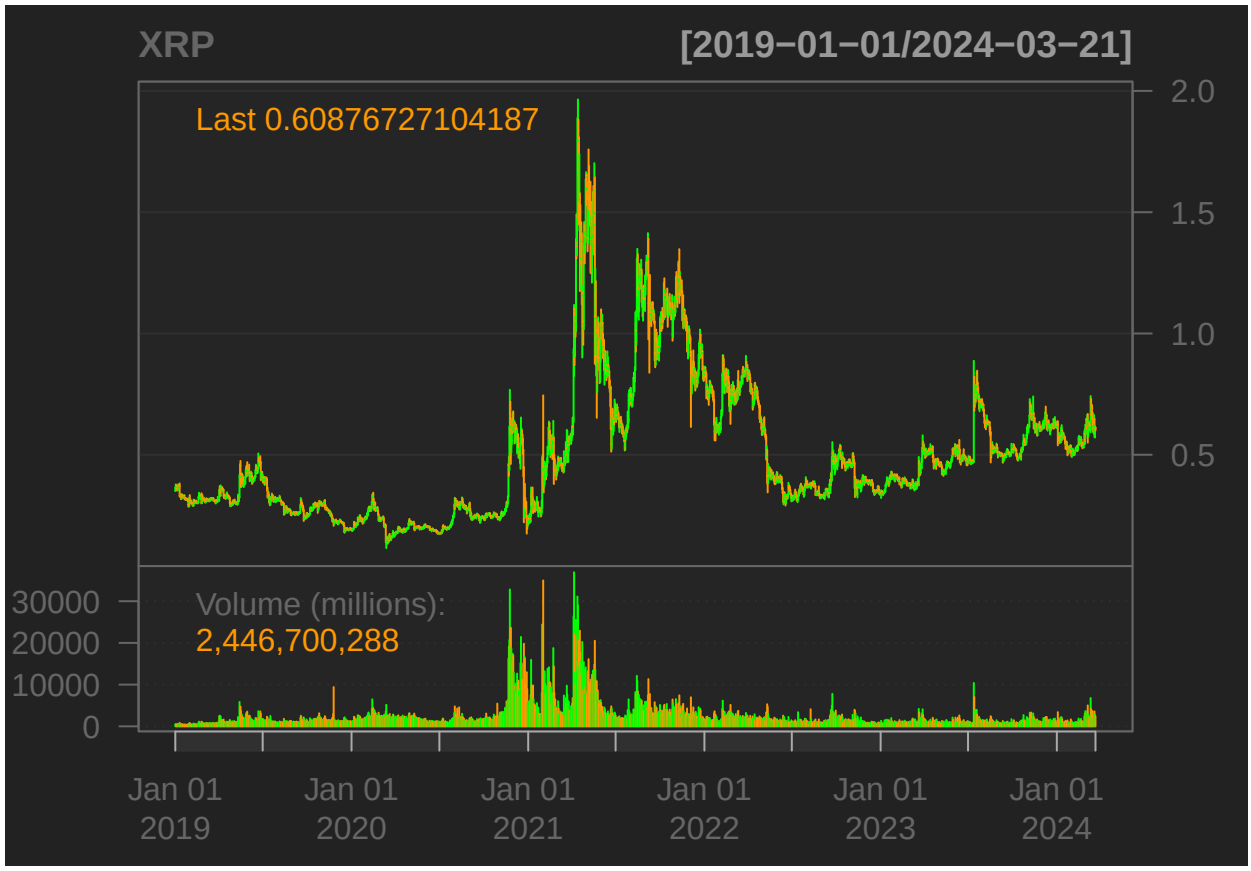

```
# 3.BNB
cci_BNB <- CCI(HLC(BNB), n = 20, c = 0.015)
barChart(BNB, theme = "black")
```




```
addCCI(n = 20, c = 0.015)
```

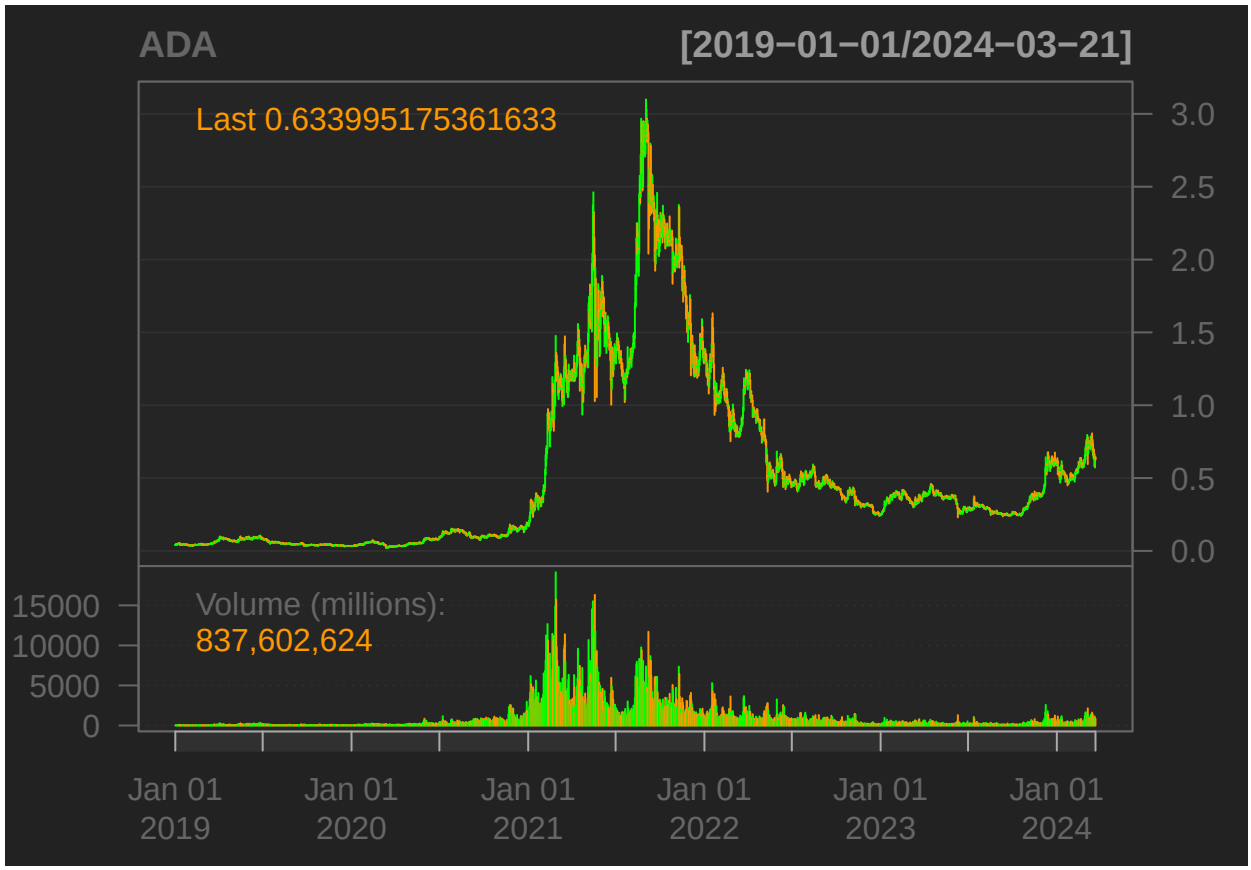



```
# 4. XRP

cci_XRP <- CCI(HLC(XRP), n = 20, c = 0.015)
barChart(XRP, theme = "black")
```




```
addCCI(n = 20, c = 0.015)
```


```
# 5.ADA

cci_ADA <- CCI(HLC(ADA), n = 20, c = 0.015)
barChart(ADA, theme = "black")
```



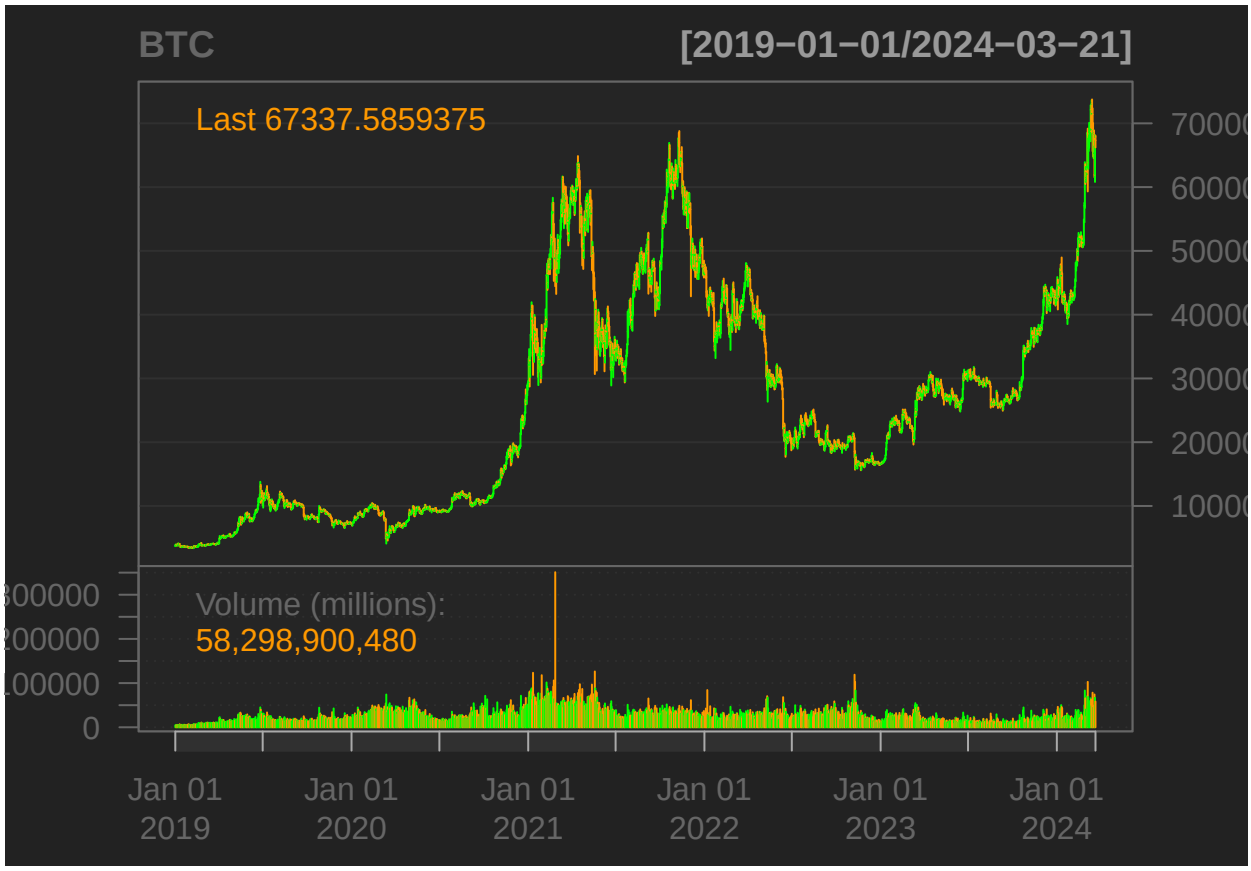

```
addCCI(n = 20, c = 0.015)
```

Tasso di variazione (ROC)

Per calcolare il ROC, dobbiamo considerare un intervallo di tempo specificato e non ci sono restrizioni nell'utilizzare qualsiasi periodo. In questo passaggio, prenderemo 25 giorni come periodo di tempo.

Il codice seguente calcolerà il ROC delle aziende insieme a un grafico:

```
# 1. BTC
roc_btc <- ROC(BTC$`BTC-USD.Close`, n = 25)
barChart(BTC, theme = "black")
```

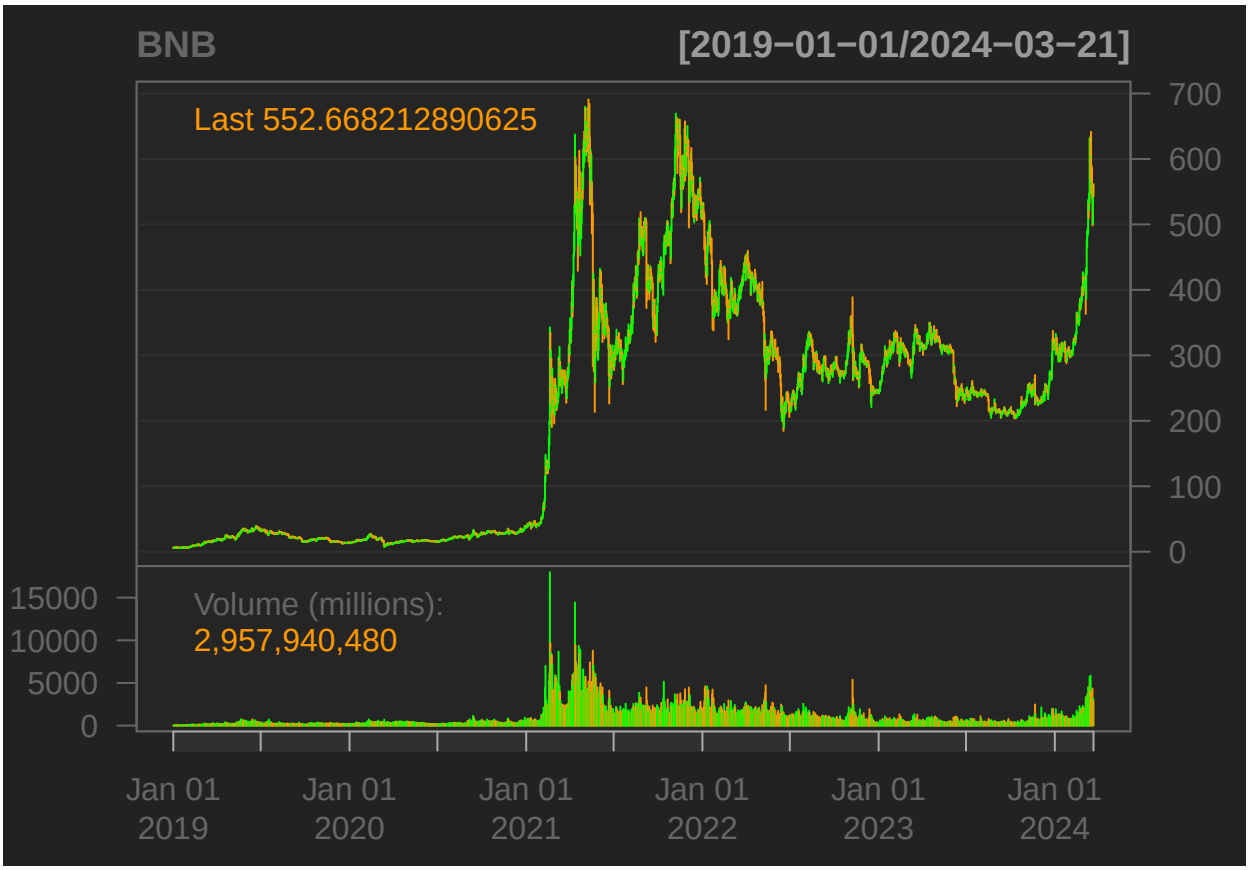



```
addROC(n = 25)
legend("left",
  col = "red", legend = "ROC(25)", lty = 1, bty = "n",
  text.col = "white", cex = 0.8
)
```


```
roc_ETH <- ROC(ETH$`ETH-USD.Close`, n = 25)
barChart(ETH, theme = "black")
```


```
addROC(n = 25)
legend("left",
  col = "red", legend = "ROC(25)", lty = 1, bty = "n",
  text.col = "white", cex = 0.8
)
```


```
roc_BNB <- ROC(BNB$`BNB-USD.Close`, n = 25)
barChart(BNB, theme = "black")
```

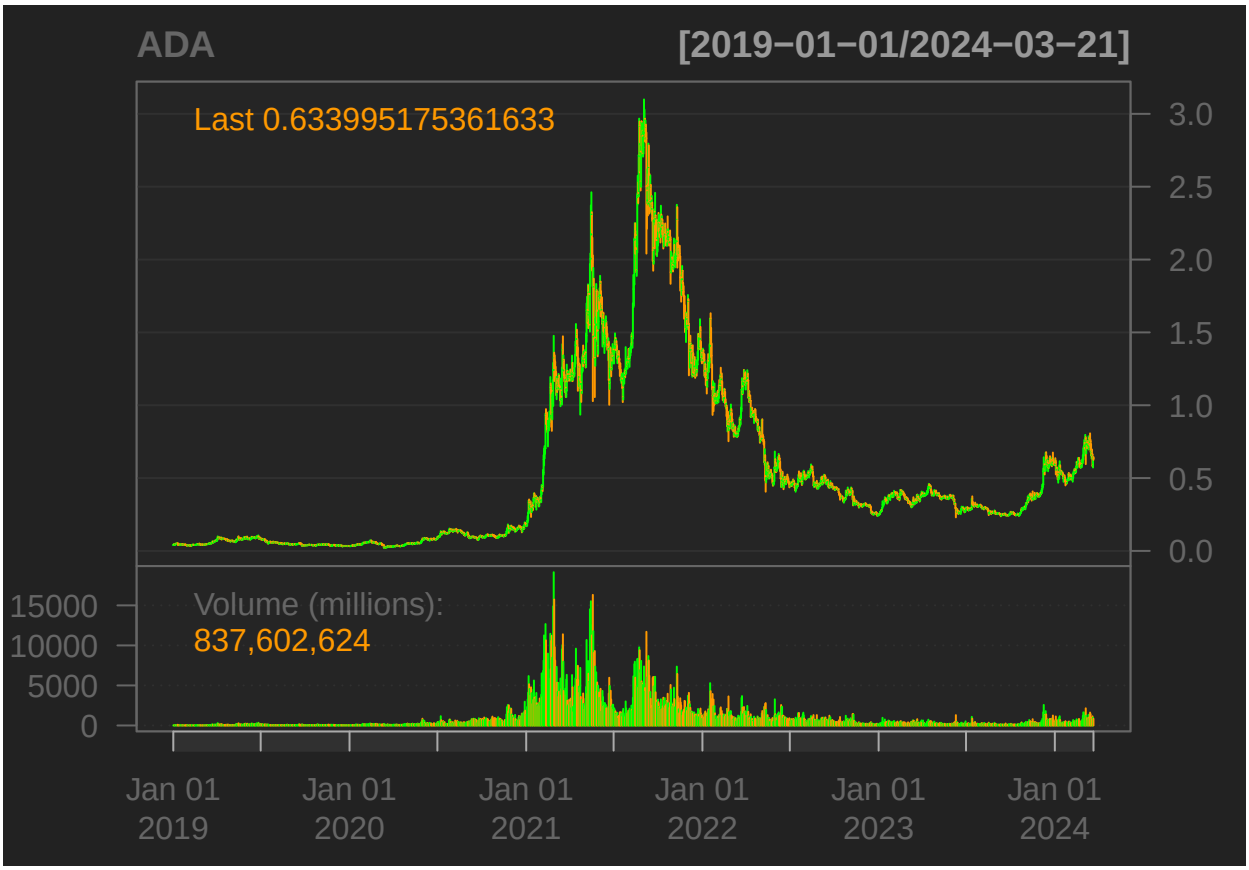



```
addROC(n = 25)
legend("left",
  col = "red", legend = "ROC(25)", lty = 1, bty = "n",
  text.col = "white", cex = 0.8
)
```


```
roc_XRP <- ROC(XRP$`XRP-USD.Close`, n = 25)
barChart(XRP, theme = "black")
```


```
addROC(n = 25)
legend("left",
  col = "red", legend = "ROC(25)", lty = 1, bty = "n",
  text.col = "white", cex = 0.8
)
```


```
roc_ADA <- ROC(ADA$`ADA-USD.Close`, n = 25)
barChart(ADA, theme = "black")
```



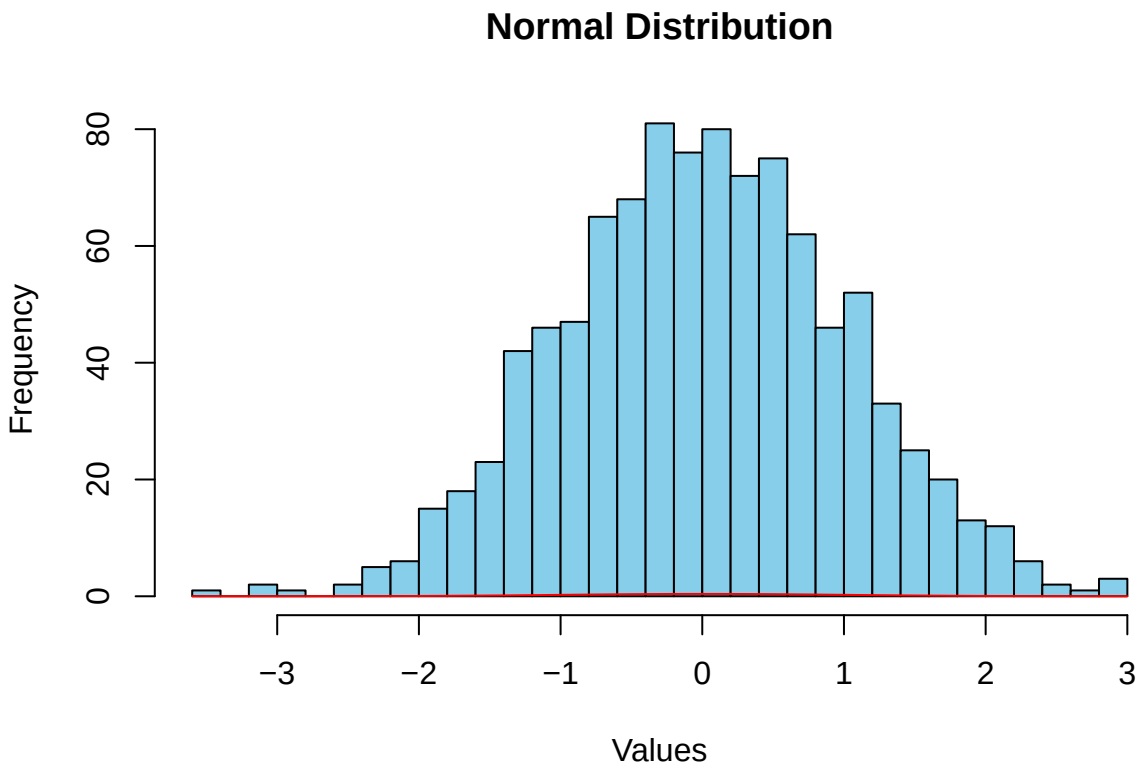

```
addROC(n = 25)
legend("left",
  col = "red", legend = "ROC(25)", lty = 1, bty = "n",
  text.col = "white", cex = 0.8
)
```


```r
# Set the number of successes (3 heads)
x <- 3

# Set the number of trials (5 coin flips)
size <- 5

# Set the probability of success (0.5 for a fair coin)
prob <- 0.5

# Calculate the probability using the dbinom function
probability <- dbinom(x, size, prob)

# Print the result
print(probability)
```

```
## [1] 0.3125
```

Generate random data following a normal Distribution

```r
data <- rnorm(1000, mean = 0, sd = 1)
# Plot a histogram of the data
hist(data, breaks = 30, col = "skyblue", main = "Normal Distribution", xlab = "Values", ylab = "Frequen
# Add a curve representing the probability density function of the normal distribution
curve(dnorm(x, mean = mean(data), sd = sd(data)), add = TRUE, col = "red")
```



In this example, we first generate a sample of random data following a normal distribution using the rnorm() function. We then create a histogram plot of the data using the hist() function, which visualizes the distribution of the data.

To overlay a curve representing the probability density function of the normal distribution on the histogram, we use the curve() function with the dnorm() function to calculate the probability density at each point.

This simple R Markdown code provides a visual and practical demonstration of the normal distribution, allowing readers to understand and appreciate this fundamental concept in statistics.