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library(timeSeries)
library(fPortfolio)
library(quantmod)
library(caTools)
library(dplyr)
library(PerformanceAnalytics)
library(ggplot2)
library(plotly)

#####
##### Etape n???1 : CREER VECTEUR PRIX EN TIME
SERIE#####

# Create vector of tickers
tickers<- c( "AAPL", "BLK", "MSFT", "NVDA", "TWTR", "SHOP", "REM", "SLV", "VGK", "META",
"ABNB", "UBER")

# Calculate returns: daily
portfolioPrices<-NULL
for (Ticker in tickers)
  portfolioPrices<-cbind(portfolioPrices, getSymbols.yahoo(Ticker, from = "2007-01-01",
auto.assign=FALSE)[,4])

# Calculate Returns: daily ROC
portfolioReturns<-na.omit(ROC(portfolioPrices), type="discrete")
portfolioReturns<-as.timeSeries(portfolioReturns)

#####
##### Etape n???2: FRONTIERE D EFFICIENCE
#####
effFrontier<-portfolioFrontier(portfolioReturns, constraints = "LongOnly")
#plot frontier
#1'-> Plot efficient frontier
#2'-> Plot minimum variance portfolio
#3'-> Plot tangency portfolio
#4'-> Plot risk return each asset
#5'-> Plot equal weingths portfolio
#6'-> Plot two asset frontiers
#7'-> Plot monte carlo portfolio
#8'-> Plot sharpe ratio
plot(effFrontier, c(1,8))
effFrontier
View(effFrontier)

weightsPlot(effFrontier)

frontierweights<-getWeights(effFrontier)
frontierweights

colnames(frontierweights)<-tickers
risk_return<-frontierPoints(effFrontier)
risk_return
write.csv(risk_return, "risk_return.csv")
write.csv2(risk_return, file="C:/Users/Laura/Desktop/file.csv")

##### Repr???sensation graphique ggplot #####

risk_return<-as.data.frame(risk_return)
t<-ggplot(data=risk_return) +
  geom_point(aes(x=targetRisk, y=targetReturn), shape="21", color="white",
fill="aquamarine2", size=2, alpha=0.7, stroke=0.3) +
  theme(axis.title = element_text(color="aquamarine2"), plot.background = element_rect(fill =
"grey20", colour = "grey20"),axis.text = element_text(colour = "white"), legend.position =
"bottom", panel.grid = element_line(colour = "grey40"), panel.background = element_rect(fill
= "grey20"))
ggplotly(t)

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#####
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cor_matrix<-cor(portfolioReturns)
cor_matrix
write.csv(cor_matrix, file="C:/Users/walid/Downloads/correlation.csv")
cov_matrix<-cov(portfolioReturns)
cov_matrix
```