import yfinance as yf

import pandas as pd

# Define the list of international indices and equities

indices = ['^GSPC', '^IXIC', '^DJI', '^FTSE', '^N225']

equities = ['AAPL', 'AMZN', 'GOOGL', 'MSFT', 'FB']

# Fetch the daily data since "2010-01-01" for indices

index\_data = yf.download(indices, start='2010-01-01')['Adj Close']

# Fetch the daily data since "2010-01-01" for equities

equity\_data = yf.download(equities, start='2010-01-01')['Adj Close']

# Calculate daily returns

index\_returns = index\_data.pct\_change().dropna()

equity\_returns = equity\_data.pct\_change().dropna()

# Calculate cumulative returns

index\_cumulative\_returns = (index\_returns + 1).cumprod()

equity\_cumulative\_returns = (equity\_returns + 1).cumprod()

# Calculate maximum drawdowns

index\_drawdowns = (index\_cumulative\_returns / index\_cumulative\_returns.cummax() - 1)

equity\_drawdowns = (equity\_cumulative\_returns / equity\_cumulative\_returns.cummax() - 1)

# Calculate Sharpe ratio

risk\_free\_rate = 0.0  # Assuming no risk-free rate for simplicity

index\_sharpe\_ratio = (index\_returns.mean() - risk\_free\_rate) / index\_returns.std()

equity\_sharpe\_ratio = (equity\_returns.mean() - risk\_free\_rate) / equity\_returns.std()

# Calculate Sortino ratio

index\_downside\_returns = index\_returns.where(index\_returns < 0, 0)

equity\_downside\_returns = equity\_returns.where(equity\_returns < 0, 0)

index\_sortino\_ratio = (index\_returns.mean() - risk\_free\_rate) / index\_downside\_returns.std()

equity\_sortino\_ratio = (equity\_returns.mean() - risk\_free\_rate) / equity\_downside\_returns.std()

# Print the results

print("Index Returns:")

print(index\_returns.head())

print("\nIndex Cumulative Returns:")

print(index\_cumulative\_returns.head())

print("\nIndex Max Drawdowns:")

print(index\_drawdowns.min())

print("\nIndex Sharpe Ratio:")

print(index\_sharpe\_ratio)

print("\nIndex Sortino Ratio:")

print(index\_sortino\_ratio)

print("\nEquity Returns:")

print(equity\_returns.head())

print("\nEquity Cumulative Returns:")

print(equity\_cumulative\_returns.head())

print("\nEquity Max Drawdowns:")

print(equity\_drawdowns.min())

print("\nEquity Sharpe Ratio:")

print(equity\_sharpe\_ratio)

print("\nEquity Sortino Ratio:")

print(equity\_sortino\_ratio)

Index Returns:

^DJI ^FTSE ^GSPC ^IXIC ^N225

Date

2010-01-05 -0.001128 0.004036 0.003116 0.000126 0.002538

2010-01-06 0.000157 0.001358 0.000546 -0.003300 0.004645

2010-01-07 0.003138 -0.000597 0.004001 -0.000452 -0.004640

2010-01-08 0.001068 0.001357 0.002882 0.007443 0.010922

2010-01-11 0.004313 0.000705 0.001747 -0.002054 0.000000

Index Cumulative Returns:

^DJI ^FTSE ^GSPC ^IXIC ^N225

Date

2010-01-05 0.998872 1.004036 1.003116 1.000126 1.002538

2010-01-06 0.999029 1.005400 1.003663 0.996825 1.007195

2010-01-07 1.002164 1.004800 1.007679 0.996374 1.002522

2010-01-08 1.003234 1.006163 1.010583 1.003790 1.013471

2010-01-11 1.007561 1.006872 1.012348 1.001728 1.013471

Index Max Drawdowns:

^DJI -0.370862

...

FB NaN

GOOGL NaN

MSFT NaN

dtype: float64