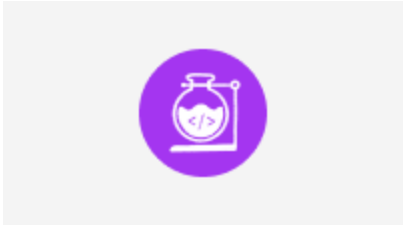
Process, Analyze, and Visualize Financial Time Series Data with Python and Pandas



Hi Tejashree! Thanks for working on this project for our team.

The Investment Management Team of our company is planning to launch a new Multi-Asset Class Fund for our retail clients. The new fund shall invest in traditional Asset Classes (Equities and Fixed Income) and alternative Asset Classes (Commodities and Real Estate). They are also considering adding Cryptocurrencies. Before our Investment Managers can decide on the composition of the new fund, they require a clean and solid data basis and an Explanatory Data Analysis (EDA). They asked our Quantitative Analytics Team to prepare such a dataset and analysis.

Your colleagues have already gathered three raw datasets from various sources: 1) a dataset (equity_fixedincome.csv) for traditional Asset Classes with daily prices, 2) a dataset (crypto.csv) with hourly Cryptocurrency prices, and 3) a dataset (alternative.csv) for alternative Asset Classes with daily prices. Your task as our Data Analyst is to load, inspect, and clean all three datasets with Python and Pandas. Then, you will align and merge all three datasets with eight Asset Classes into one large dataset. The merged dataset shall contain daily End-of-Day price data. While datasets 1) and 3) are aligned to New York Stock Exchange trading days (Timezone: US/Eastern), you need to resample and align the Cryptocurrency dataset with hourly price data (Europe/Berlin Timezone) first. You shall then visually compare the Performance of all Asset Classes with a normalized Price Chart (Base Value: 100) and prepare a separate dataset with financial returns (price percentage changes). Analyze and visualize the dispersion/volatility of returns and calculate the annualized mean return (reward) and the annualized standard deviation of returns (risk) for each Asset Class. Finally, calculate and visualize (heatmap) the pairwise correlation of returns.

How you'll work

Your project has been broken into a set of tasks. To complete these tasks, use the provided workspace. You can launch your workspace by clicking below or using the button in the top right of the screen.

Each task includes step-by-step instructions as well as helpful documentation and necessary assets in the Resources section.

See your tasks