Pandas with Time Series

PIERIAN DATA

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- Now that we have an understanding of how to work with pandas for general data let’s go over a few key points of working with time series data with pandas!

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- The majority of our data will be in the form of a time series, with a DateTime index and some corresponding value.
- We will learn how to use pandas' special time series features to work with this sort of data.

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- This section will cover the following:
    - DateTime Index
    - Time Resampling
    - Time Shifts
    - Rolling and Expanding

Let’s get started!

DateTime Index

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- Often the time and date information won’t just be in a separate column, but instead be the actual index!
- Let’s discover the built in pandas tools for creating and working with a DateTime Index.

Time Resampling

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- We will usually get data that has a DateTime Index on a smaller time scale (every day, every hour, etc...)
- However, it is often a good idea to aggregate the data based off some frequency (monthly, quarterly, etc...)

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- While using groupby could solve part of this issue, a simple groupby isn't "smart" enough to understand things like business quarters or business year starts.
- Luckily, pandas has frequency sampling tools to help with this!

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- To learn about this, we will use a stock market data set of Walmart prices.
- Its located under the time_data folder under the 5-Pandas-with-Time-Series folder.
- Let’s get started!

Time Shifting

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- Certain models will require us to shift our data forward or backward a certain amount of time steps.
- Luckily pandas makes this very easy, let's find out how!

Rolling and Expanding

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- We can use pandas' built-in rolling methods to create things like a rolling mean based off a given time period.
- Let's quickly discuss what a rolling method can be used for.

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- Often daily financial data can be a bit noisy.
- We can use the rolling mean (often called Moving Average) to get more signal about the general trend of the data.

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- You will provide a window of a set time period and then use that to calculate your aggregate statistic (such as the mean).
- Let’s see what this looks like with pandas in our jupyter notebook!

Bollinger Bands

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