smartbi

AaltoAI Hack and Chill Challenge Description 1.12.24

Challenge: Spot-pricing-challenge

Problem

In Finland, many energy companies offer hourly pricing (spot pricing) for electricity agreements. These hourly prices are uniform across companies and are published the day before by 15:00. This gives consumers the opportunity to adjust their electricity usage to minimise costs.

Spot pricing is designed to balance the supply and demand of energy. Several factors influence these prices, such as:

- **The cost of fossil fuels and nuclear energy**
- **Renewable energy availability** (e.g., wind and sunshine)
- **Temperature** and its impact on demand (e.g., cold weather increases heating needs)

While knowing the electricity prices for the next day is useful, it does not enable long-term planning. Reliable estimates of electricity prices further into the future could benefit:

- **Energy producers**, allowing them to price their products more efficiently.
- **Consumers**, enabling them to plan energy usage for periods with lower prices or a higher share of renewable energy.

Solution

Your task is to develop a model that estimates spot electricity prices further into the future. You are free to:

- Choose the timeframe you want to predict (e.g., identifying cheap hours or days).
- Select the data you consider most relevant for your model. You can **either use the existing data or come up with new data** you consider relevant!

Resources:

To get started, you can use this repository: Spot-Pricing Challenge Hackathon.
The repository includes:

- Preprocessed datasets (.pkl files) with weather and spot-pricing data since early 2021, as well as resource and index prices since late 2022.
- A main.py script for working directly with the existing data.
- Data generation scripts (generate_*.py) for creating or modifying datasets. In particular, adding tickers to generate_stock_data.py is extremely easy.

Further instructions are available in the repository's README file.

Submission Guidelines:

Submissions can take various forms, including:

- A prototype (e.g., an app, bot, or demo).
- A high-level conceptual presentation.
- A demo video (2-3 minutes) showcasing the solution's functionality.