

Frank Energie Smart Asset Developer Test

In the intraday electricity market energy is traded per delivery quarter. The quantity is typically given in MWh and the price in EUR/MWh. In this test we want you to receive order updates from the market and use those to maintain an order book. Then, from that order book, an optimal strategy should be determined to charge the EVs of your clients.

We start the day at 00:00 and assume that we have to complete the following charging plan for our EV fleet:

Group	A	B	C	D	E	F
Start_time	00:00	00:00	13:00	13:00	17:30	17:30
End_time	08:30	11:00	18:00	21:00	22:00	23:59
Needed Charge (MWh)	5	10	4	20	5	15
Max Power (MW)	2	3	1	6	2	5

In the enclosed .zip file you find a skeleton Kotlin Spring application. Please extend it with:

- Logic to maintain an order book from the posted order updates, where the core idea is that for every order you check if there is an opposite order in the book. If so, the quantities of the matching orders cancel out and remaining quantity is added to the book, if not, the entire order is added to the book.
- An endpoint to receive an overview of all quarters with the highest buy prices and the lowest sell prices.
- Optimization logic to optimize the car charging plan above given the current state of the market. So every time a new market price comes in, you decide again how and when to charge your cars where you take into account what you already have charged.
- Create a client where you keep track of the steering signals you are sending to the different groups of cars at different time points (you can mock it writing to a file or database).

- Create a client to keep track of the orders you are sending to the market to actually purchase the energy you need to charge your cars or to sell the energy for a given future quarter if your new optimization decides not to charge your cars in that quarter (you can mock it writing to a file or database).
- Calculate what your average price per MWh is that you had to pay for sourcing the energy for your client's EVs.