Assignment Description

For the final part of the first assignment, you will receive multiple files containing the data of the uploaded agents in the HomeLab, each spanning a day of data.
This file contains the **full measured data** for the evaluated day, recorded at approximately **1-second granularity**. These measurements reflect the real-world execution of the hour-based actions provided by your agent.
Minor observations:

- The data does not show the household consumption data (which was still considered).
- The last hour of the day, the actor loses control over the battery for resetting the framework.
- The sign of the battery action is flipped compared to the simulation one.

Important Notes

- The real-world evaluation in the HomeLab will **not** be judged based on the agent's performance. Instead, we will assess your **observations, insights, and ideas** presented in the essay.

- Your essay should include:

    - A **textual discussion** (maximum **400 words**).
    - **Plots or images** that support your analysis. For example, if you identify a time window where something is worth discussing, include a graph illustrating it. Ensure every figure is properly referenced in the text.

Points to Address in Your Essay

1. **Differences between the real-world environment and the simulated one.**

2. **Impact of the simulated environment on your agent's performance.**
   Consider questions such as:

    - Does the battery behave as expected compared to the idealized dynamics in simulation?
    - Can you identify physical constraints that make real battery dynamics differ from the simulated model?
    - Does the measured PV data align with the state information used by the agent to make decisions?

3. **Ideas for improving the agent.**

    - If you were the engineer responsible, what changes would you implement?
    - Did discrepancies between simulation and reality significantly affect performance? How could you have mitigated this?
    - Given that the simulation had fixed parameters (timestep length, battery features, data, etc.), what alternative approaches could improve performance? What challenges might arise from these changes?