Exploratory Analysis of EnergyPlus Simulation Data with Database Management and Web-Based Visualization

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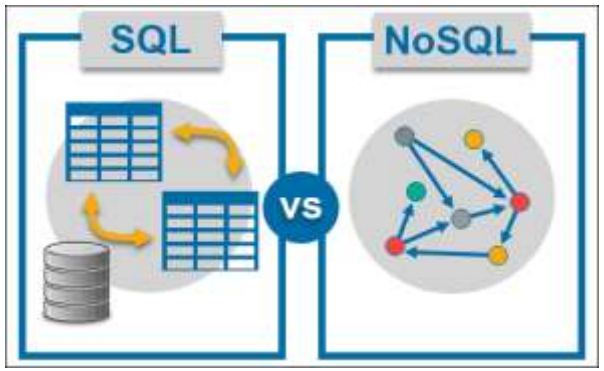
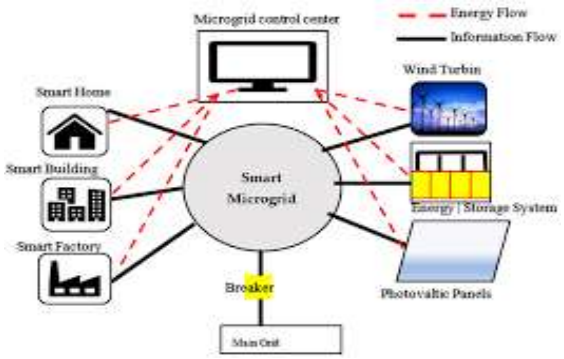
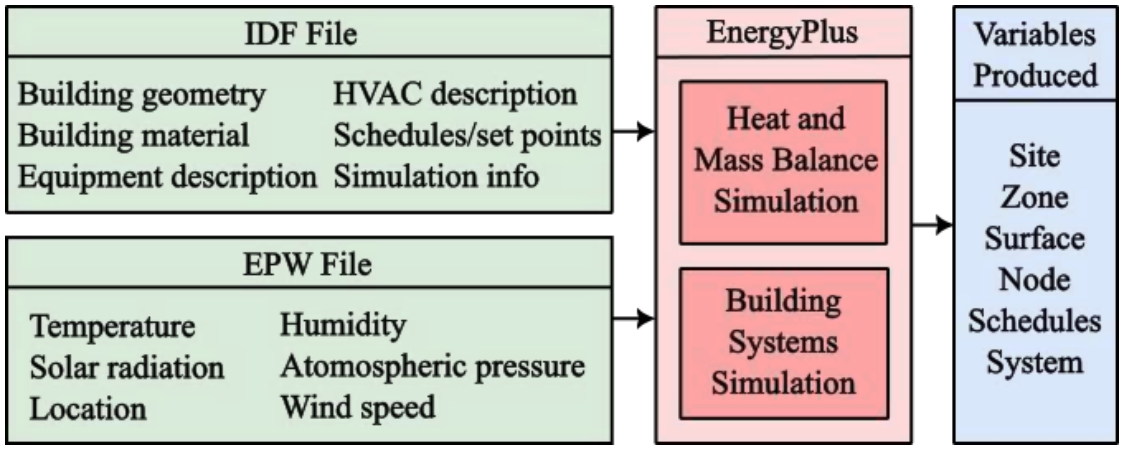




BACKGROUND and MOTIVATION

- Buildings account for over 40% of electricity consumption in the U.S. Modling buildings for power system optimization is critical
- Our project leverages a prototypical dataset from Pacific Northwest National Laboratory (PNNL), rich in building and weather data.
- EnergyPlus developed by PNNL is used to simulate the buildings and generate data to study the performance
- EnergyPlus is a high-value simulation tool, providing detailed insights into building energy consumption and HVAC performance across various zones within the building.



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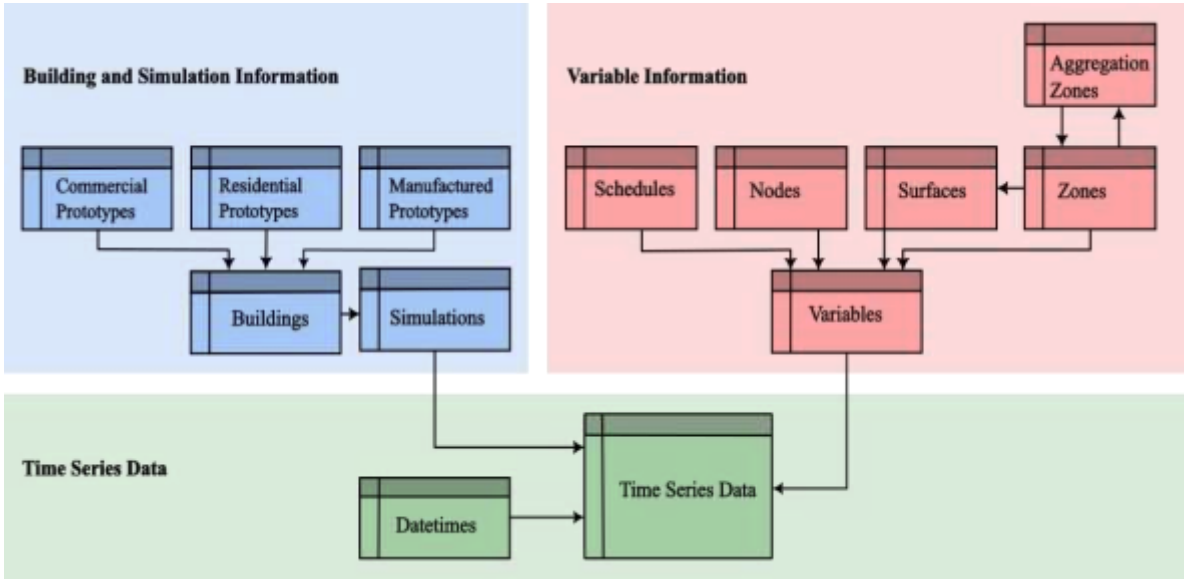
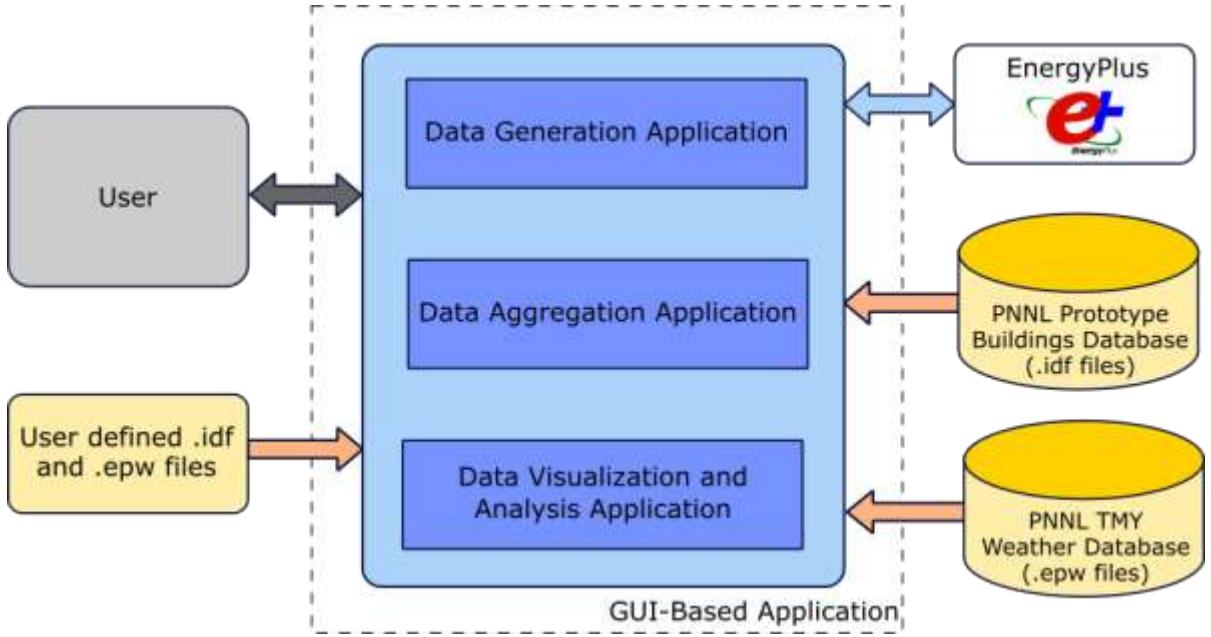
EnergyPlus Simulations and Data Management





- To manage the volume and complexity, NoSQL databases provide efficient and flexible storage solutions.
- The goal is to create a web app for interactive analysis, enabling visualization of energy performance across climate zones and schedules.

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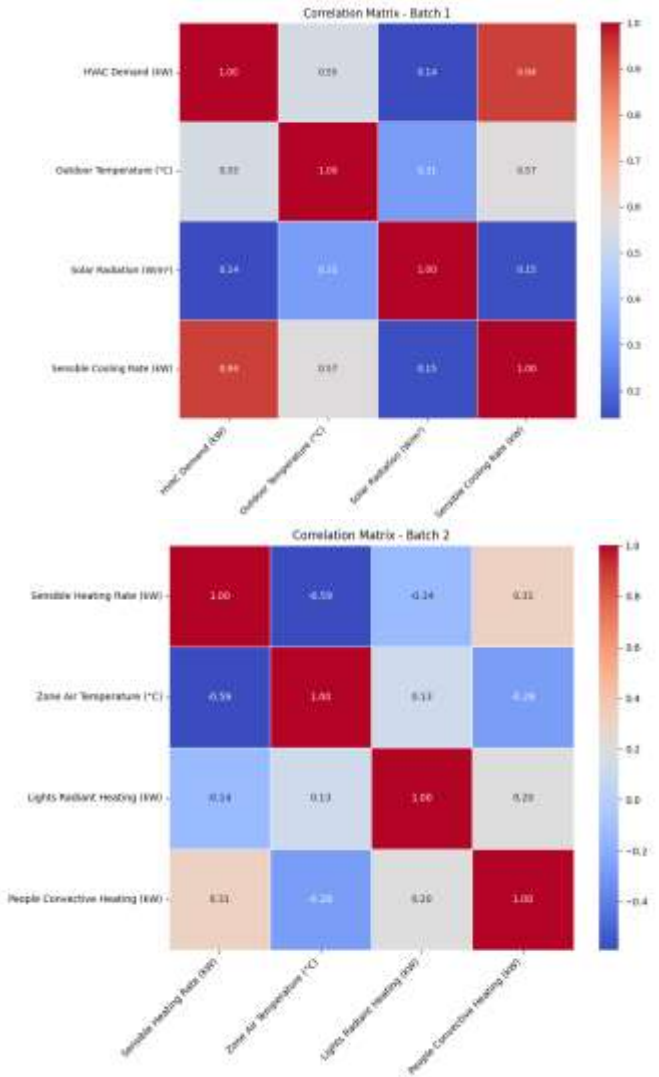
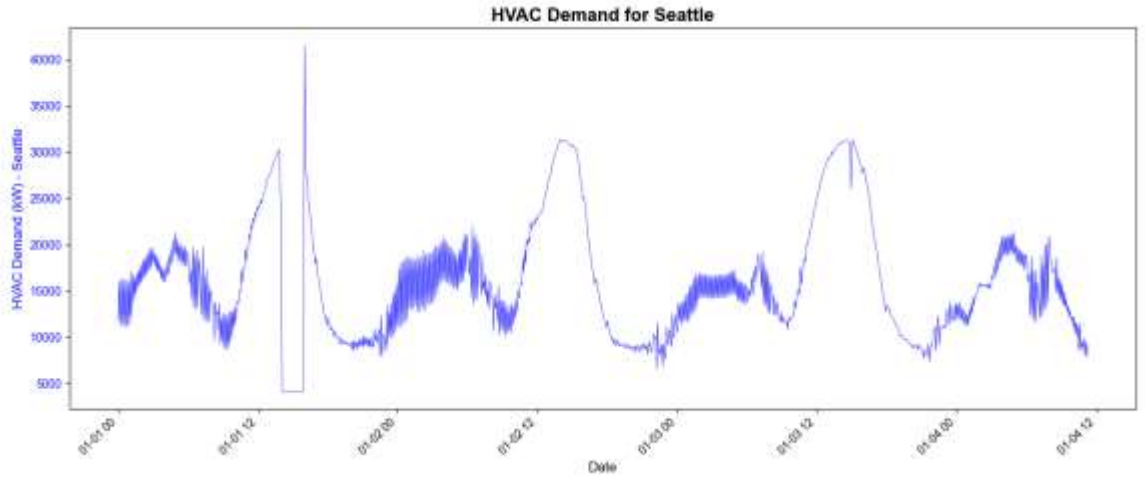
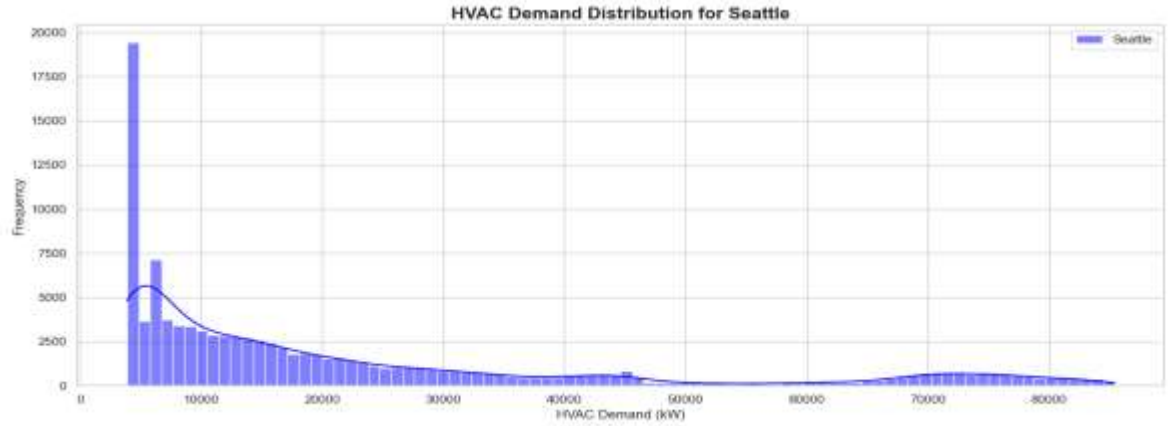
Exploratory Data Analysis

Correlation Matrix



Time Series Plot





Histogram

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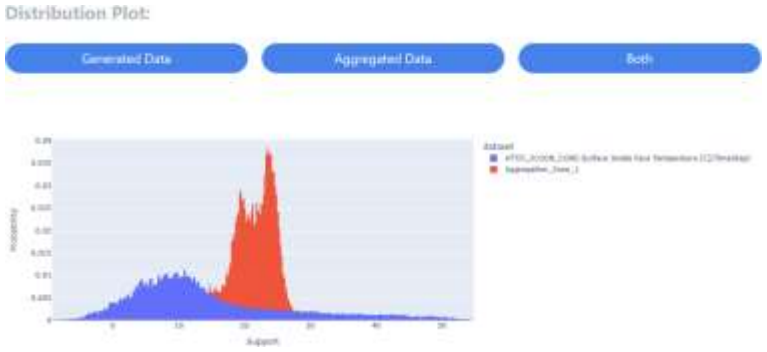
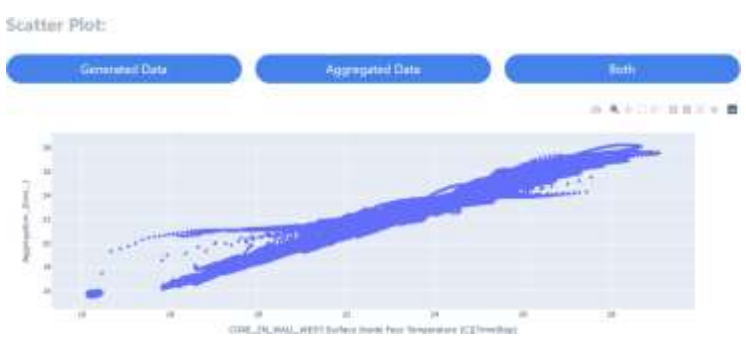
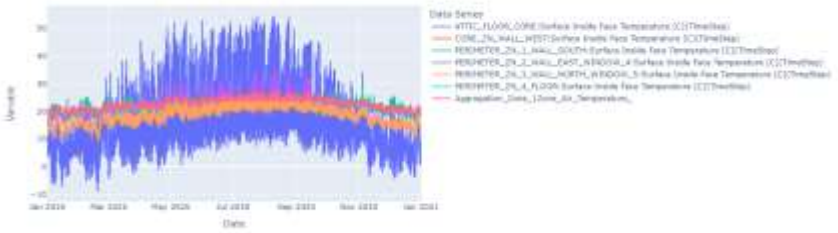
WEB-APP VISUALIZATION







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