Project Proposal

By Group 5: Pocket Aces

Title: Analyzing GASTech Building Operations Data

Introduction:

We propose to explore and analyze the GASTech Building Operations data sets from the VAST Challenge 2016, specifically focusing on Mini-Challenge 2. Our analysis aims to unravel valuable insights and patterns within the provided data, shedding light on the interactions between employee movements and building operations. By harnessing data visualization and analytical techniques, we will gain a comprehensive understanding of the GASTech Corporation's facility operations.

Selected Data Set:

Our analysis will primarily focus on the following data sets:
Building Layout: To understand the physical structure of the GASTech building, including proximity and energy zones.
Employee List: To identify and categorize employees' roles and office assignments.
Proximity Sensor Data: To track the movements of employees using proximity cards within the building.
HVAC Sensor Readings: To monitor the status of the building's heating, cooling, and air circulation systems.
Hazium Readings: To assess the presence of potentially hazardous Hazium gas.

Analysis Plan:

Our analysis will encompass the following key aspects:

- Employee Movement Patterns: We will analyze the prox card data to identify typical movement patterns of GASTech employees. This includes understanding the daily routines of different employee roles, break times, meetings, and office visits.
- Building Operation Characteristics: We will explore the building operation data to identify daily building characteristics, such as electricity demand, temperature setpoints, air supply rates, and lighting power consumption. This analysis will help us understand the normal operational patterns of the facility.
- Anomaly Detection: We will actively search for anomalies in the data, such as unusual temperature spikes, high power demand, or hazardous gas concentrations. We will prioritize anomalies that could represent safety or operational concerns for the building.
- Relationships Between Proximity and Building Data: Our analysis will uncover relationships between employee behavior and building conditions. For example, we will investigate whether employee movements correlate with changes in HVAC system status or lighting power.

Tools and Technologies:
We will employ Python, leveraging the power of Pandas and NumPy for comprehensive data preprocessing. MS Excel will complement these tools for specific data manipulation tasks. For impactful data visualization, Tableau will be our primary platform, while QGIS will enable dynamic visualization, offering a well-rounded toolkit for our analysis.

Conclusion:
Our analysis of the GASTech Building Operations data will provide critical insights into the daily routines of employees, building operation patterns, and potential anomalies or safety concerns. This information can help GASTech Corporation optimize its building operations, enhance security measures, and improve energy efficiency. We are committed to utilizing data visualization techniques to present our findings effectively, aiding decision-makers in making informed choices for the company's facility management.