Fault Detection and Diagnostics Automation using 5-minute Building Automation System Data II

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Project Number CS 24-330

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This capstone project aims to develop a command-line program, “fcltls” to automate data processing workflow for six different types of data: utility bill data, Dominion, Navigator, electric interval data, Waterscope, and Weather. The command “fcltls” is designed to be a user-friendly, flexible, and scalable tool for users to customize their workflows based on their needs. The command automates the data processing steps by data cleanup, loading, and filtering to help users analyze and access the data efficiently. Additionally, it supports enhanced operational efficiency, potentially leading to cost savings that can be reinvested into educational programs and resources.

The workflow tasks are scanning the directory for unloaded files, loading data files into the database, filtering the database by time range and the data, having an output of filtered data in a long format, and visualizing data using Matplotlib. The workflow begins by scanning the root directory (DATA) for newly added data files across all metrics using the "fcltls scan-for-new-files" command. Then, the program loads these data files into an SQLite database using the “fcltls add-new-files-to-database” command. Users can filter the data based on the time range and the data they provide using the “fcltls filter-database” command. The program provides filtered data with the time range and data in a structured format. Using the Mathplotlib library with the “fcltls plot” command, the program creates charts for data visualization. The program also allows users to erase data from the database using the “fcltls reset-database” command.

Keywords: Data Processing, Data Analysis, Command-Line Program, Automation

