

System Design – Generator Runtime and Emissions Reporting System

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Introduction

Business Problem

System issues

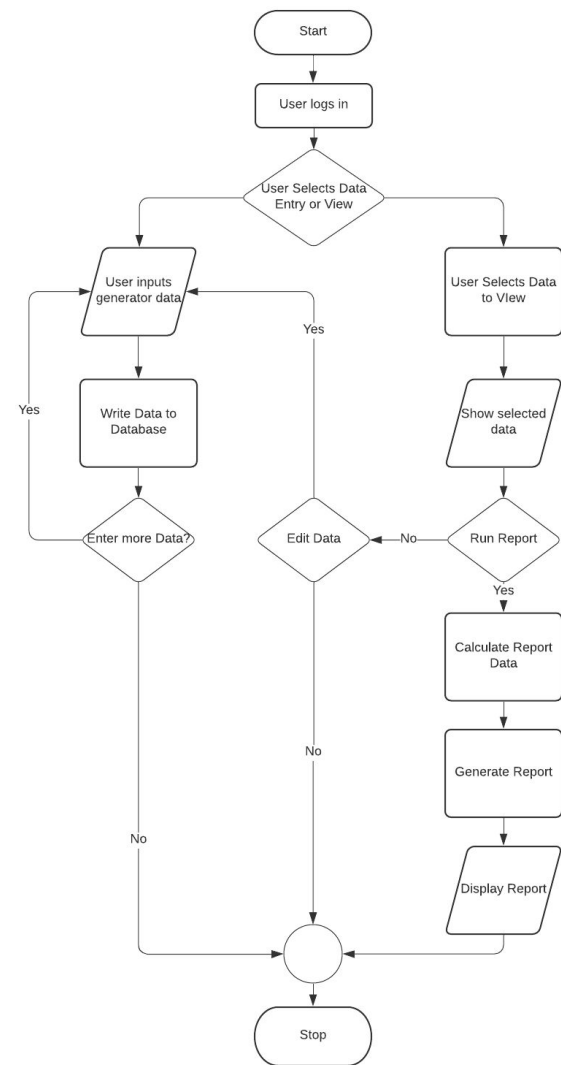
User requirements

Business Value

- Businesses operating backup Diesel generators are required by state agencies and the EPA to record engine usage details to allow for calculation of emission levels from the equipment annually.
- The current system does not provide for data control and relies on manual calculation and entry of data for the annual report. This introduces error and takes excessive man hours.
- Users require a secure system with the ability to allow for data entry, storage, viewing, and report generation. The system must also validate information upon entry.
- The system will streamline the process of data entry and report generation. It will also improve data quality, provide data validation upon entry, and alert users if operating activities are putting them at risk of permit violations.

Application Flow

- Overall Application Flow
 - Based on User Permissions
 - Enter Data
 - Calculating Report Data
 - Generate and Display Report
- List of Functions
 - print()
 - if()
 - elif()
 - for()
 - def()
 - return()
 - import()
 - try()



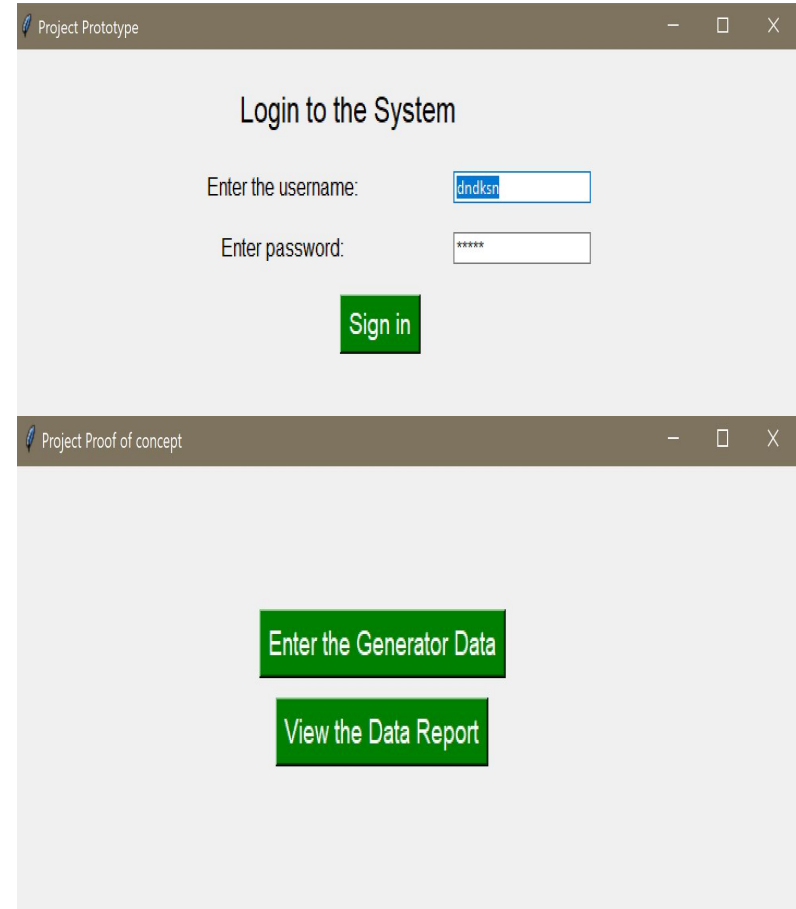
Interface

Login Screen:

- Label Widget for User ID and Password Entry
- Input widget for User ID and Password Entry

Option Selection Screen:

- Label Widgets to identify the screen and selection options
- Button Widgets - Input Data or view data



Interface

Data Input Screen:

- Label widget to identify screen and entry fields
- Input Widget for all data fields
- Button widget to accept entry

Data View Screen

- Label Widget to identify screen and entry field
- Input widget for data range start and end
- Button widget to process request

Enter Generator Data

Enter the Air pump:

Enter the pressure:

Enter the day of the week:

Insert the Data

Data Report

Day	Pump	Pressure
Monday	0	0
Tuesday	0	0
Wednesday	0	0
Thursday	28	99
Friday	9987	282
Saturday	0	0
Sunday	0	0

OK

File System Design

Currently stored in a
.csv file

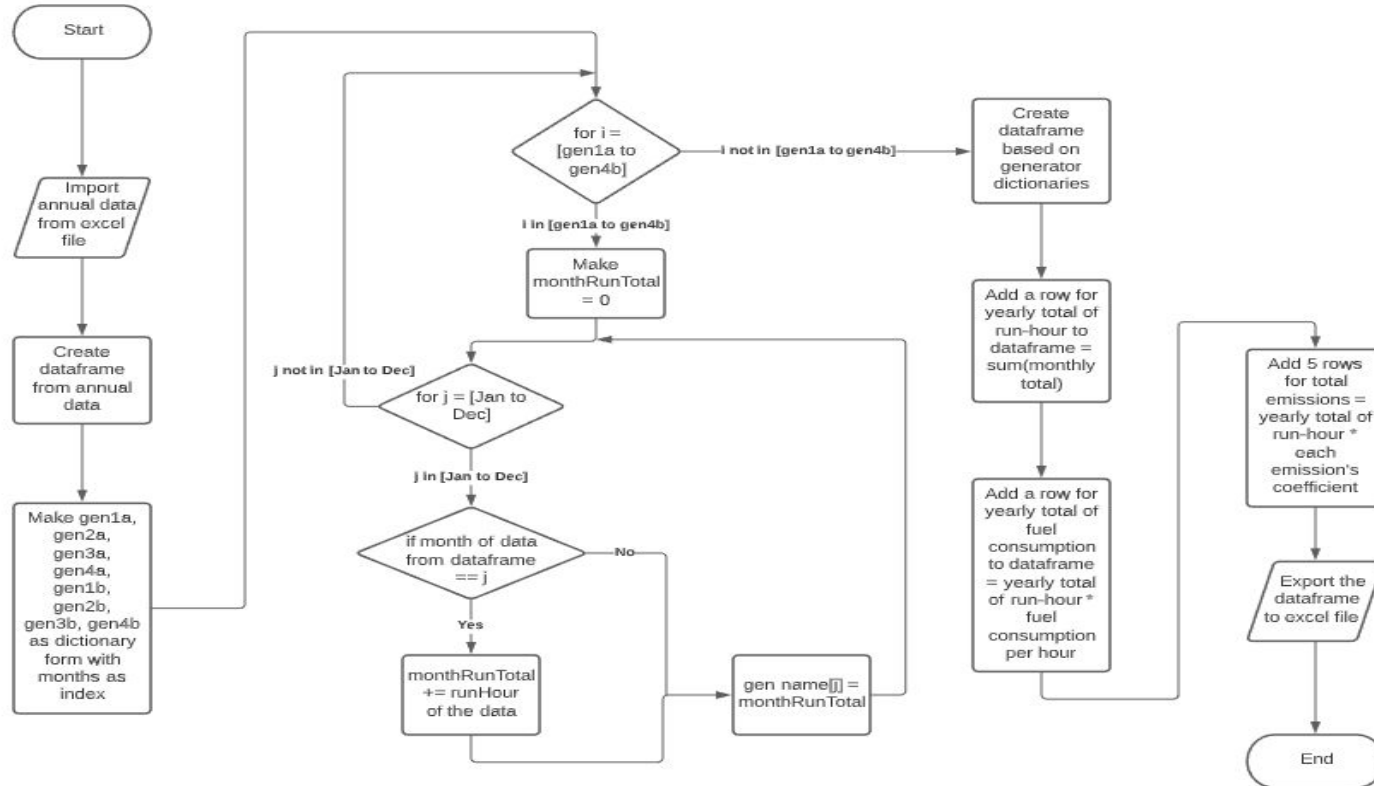
Login Data Dictionary

Field Name	Data Type	Data Length	Description
userName	String	16	Name of user
userPassword	String	24	User password
accessLevel	String	24	Access rights granted to the user

Generator Data dictionary

Field Name	Data Type	Data Length	Description
generatorName	String	5	Name of generator run
startDate	Date	8	Day that generator run started
startTime	Time	5	Time that generator run started
endDate	Data	8	Day that generator run ended
endTime	Time	5	Time that generator run ended
loadLevel	Int	4	Average load level during run

Detailed Design



Project Fulfillment Estimation

- (a) Variables;
- (b) Flow control (if ... else, and loops);
- (c) Functions;
- (d) Lists and Dictionaries;
- (e) Multiple modules;
- (f) File or database CRUD (Create, Read, Update, Delete) operations.
- (g) Data computation and visualization.