Module 6: Assignment

Problem Statement 1:

With the increasing prevalence of electric vehicles (EVs), there's a demand for efficient power management systems. Developing a MATLAB program to accurately calculate the power delivered from the battery to the electric motor is crucial for performance evaluation and optimization.

Objective:

The objective is to create a MATLAB program that prompts users for the vehicle name, battery voltage, and current drawn from the battery. It should validate inputs (ensuring positive values for voltage and current), calculate the power delivered to the motor, and display the result.

Formula: **P = V * I**

Tasks to be Performed:

1. Design a MATLAB script for user input and execution initiation.
2. Implement input validation to accept only positive values for voltage and current.
3. Develop the power calculation formula using the accepted inputs.
4. Incorporate error handling for invalid inputs or unexpected errors.
5. Test the program with various scenarios for accuracy and robustness.
6. Enhance user experience with clear messages and interfaces.
7. Thoroughly document the program for future reference and maintenance.

Problem Statement 2:

Alice, an environmentalist, needs to calculate the energy requirement for a 2-hour journey to ensure her chosen electric vehicle (EV) has a sufficient battery capacity.

Objective:

Develop a MATLAB program that prompts Alice to input the journey's power requirement (in kW) and duration (in hours), calculates the energy requirement and displays the result. Ensure inputs are non-negative, displaying an error message if they are negative.

Formula Used: **Energy = Power * Time**

Tasks to be Performed

1. Prompt input for power and duration of the journey.
2. Implement control statements to ensure non-negative inputs.
3. Calculate energy requirement using energy = power * time.
4. Display the calculated energy requirement.
5. Provide error handling for negative inputs.