Module 11: Assignment

Modelling Differential Equation

Submitted by:

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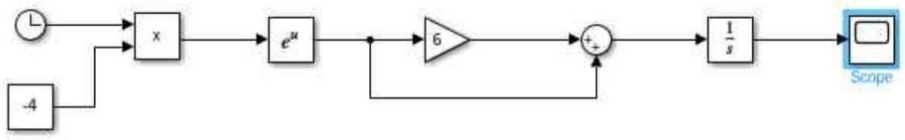
Problem Statement

As part of the EV modeling team, you're tasked with creating a Simulink model to simulate the charging behavior of an EV battery. The model will depict voltage dynamics using a first-order differential equation, dv/dt = 6e^(-4t) where, v is the voltage of the battery and t is time. Your goal is to visualize how the battery voltage changes over time during charging, starting from an initial voltage of 0 volts.

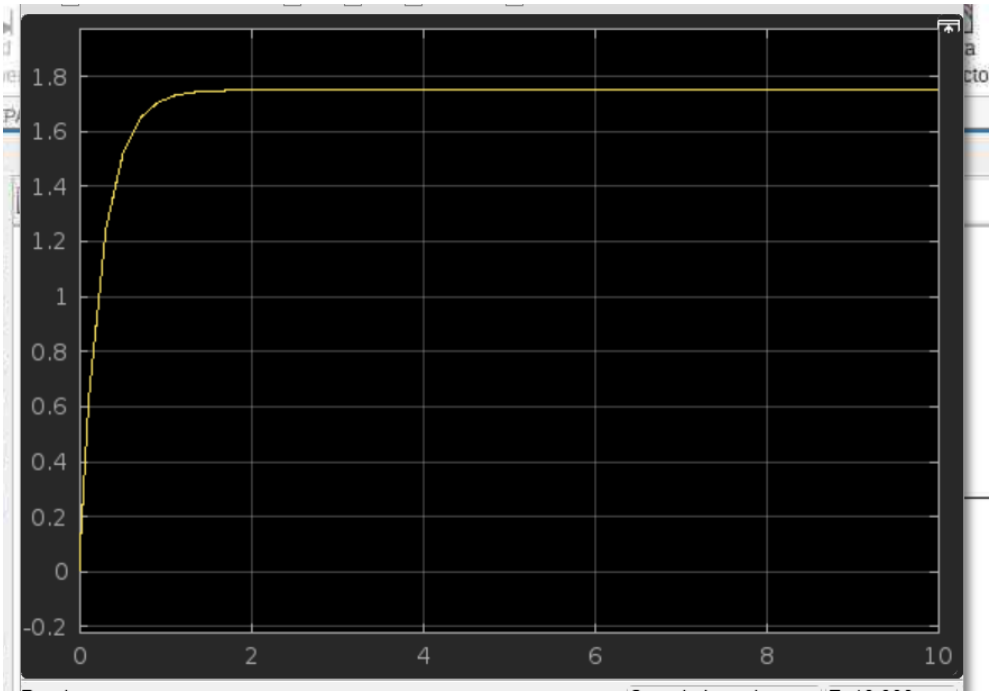
Task to be performed:

- Design a Simulink model to simulate EV battery charging dynamics.
- Set the initial voltage of the battery to 0 volts.
- Implement the first-order differential equation representing voltage dynamics.
- Visualize the output voltage over time using a scope block.

Simulink Model for EV battery Charging Dynamics:



scope output:



The Scope will display a plot of v(t)versus time:

- The graph will start at 0 t=0).
- It will rise rapidly at first and then taper off, approaching v(t) = 1.5 as t increases.

This behavior represents the charging of the battery, where the voltage gradually increases and saturates over time.