Loops and Orbits – Homework 3 – Capacitor

DUE FRIDAY 1/24, BY END OF OFFICE HOURS

the equation

$$V_0 = IR + \frac{Q}{C}$$

(I: current; Q: charge; C: capacitance; V_0: DC supply; R: resistance)

was turned into a model the computer can handle as follows:

$$V_0 = \frac{Q_{i+1} - Q_i}{t_{i+1} - t_i} R + \frac{Q_i}{C}$$

Rearrange

$$Q_{i+1} = Q_i + \frac{t_{i+1} - t_i}{R}\left(V_0 - \frac{Q_i}{C}\right)$$

So that tells you how to get charge_after from charge_before

This is an easy model but a hard homework because for the first time I want you to produce the notebook on your own. You are welcome to borrow code from any of our other notebooks.

At the end of your notebook should be a graph of $\frac{Q}{C}$ as a function of time

Turn in that graph by 2pm on Friday as your completed homework.