SOLVING LCR CIRCUIT USING RUNGE KUTTA METHOD-19003//ABHISEK PRAHARAJ

Charging of Capacitor in LCR circuit. The enf equation for the circuit is

$$L\,d^2q/dt^2 + R\,dq/dt + q/c = E \quad \text{----------1}$$

Where q(t) i sthe instaneous charge on the capacitor. The second order oDE can be split into 2 first order coupled ODEs

$$dq/dt = i = fi(q, i, t) \quad \text{----------2}$$

$$di/dt = (E - Ri - q/c)/L = f2(q, i, t) \quad \text{------3}$$

There are 3 cases on interest-

- OverDamped when R>2 sqrt(L/C)
- CriticalDamped when R=2 sqrt(L/C)
- UnderDamped when R<2sqrt(L/C)