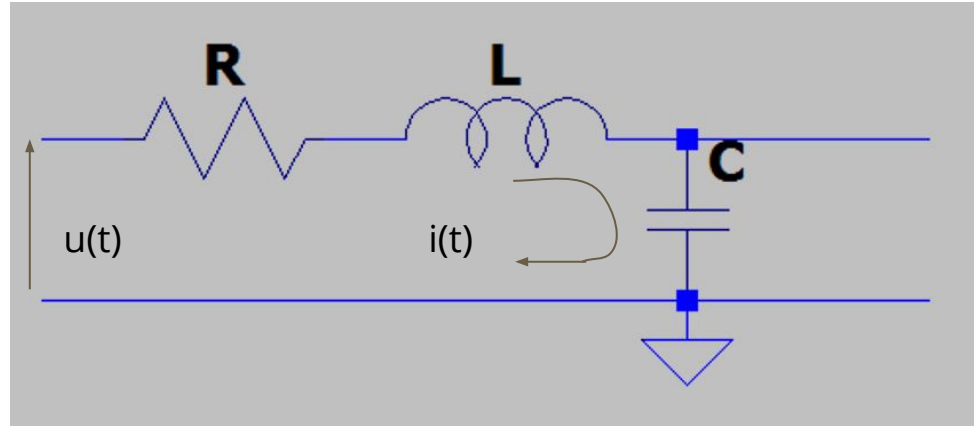
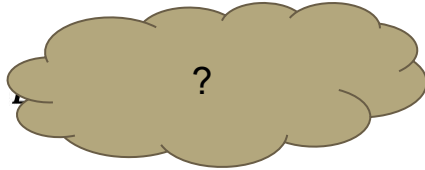

Simulation of Electric Circuit

— Electric, Electronic and System —
Engineering

RLC Circuit

Equation

$$u(t) = Ri(t) +$$



$u(t)$: Input Voltage

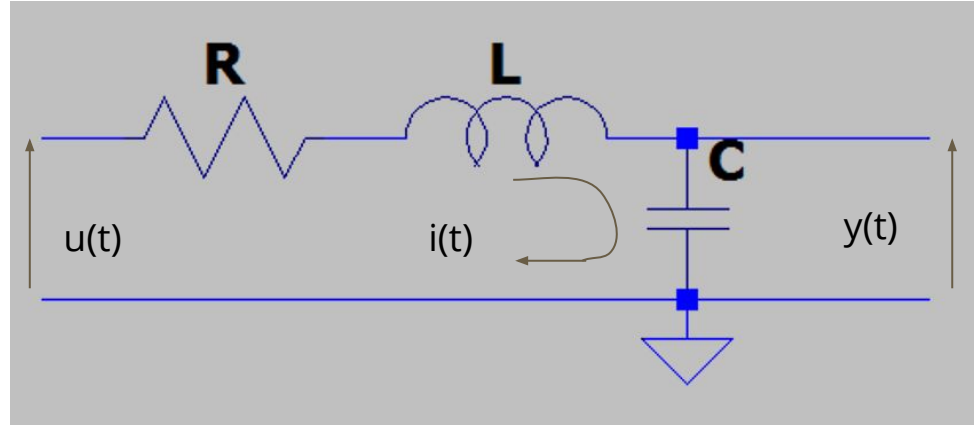
Equation

$$u(t) = Ri(t) + L \frac{di(t)}{dt} + \frac{1}{C} \int_0^t i(\tau) d\tau$$



$$L \frac{di(t)}{dt} = u(t) - Ri(t) - \frac{1}{C} \int_0^t i(\tau) d\tau$$

$$\frac{di(t)}{dt} = \frac{1}{L} u(t) - \frac{R}{L} i(t) - \frac{1}{LC} \int_0^t i(\tau) d\tau$$

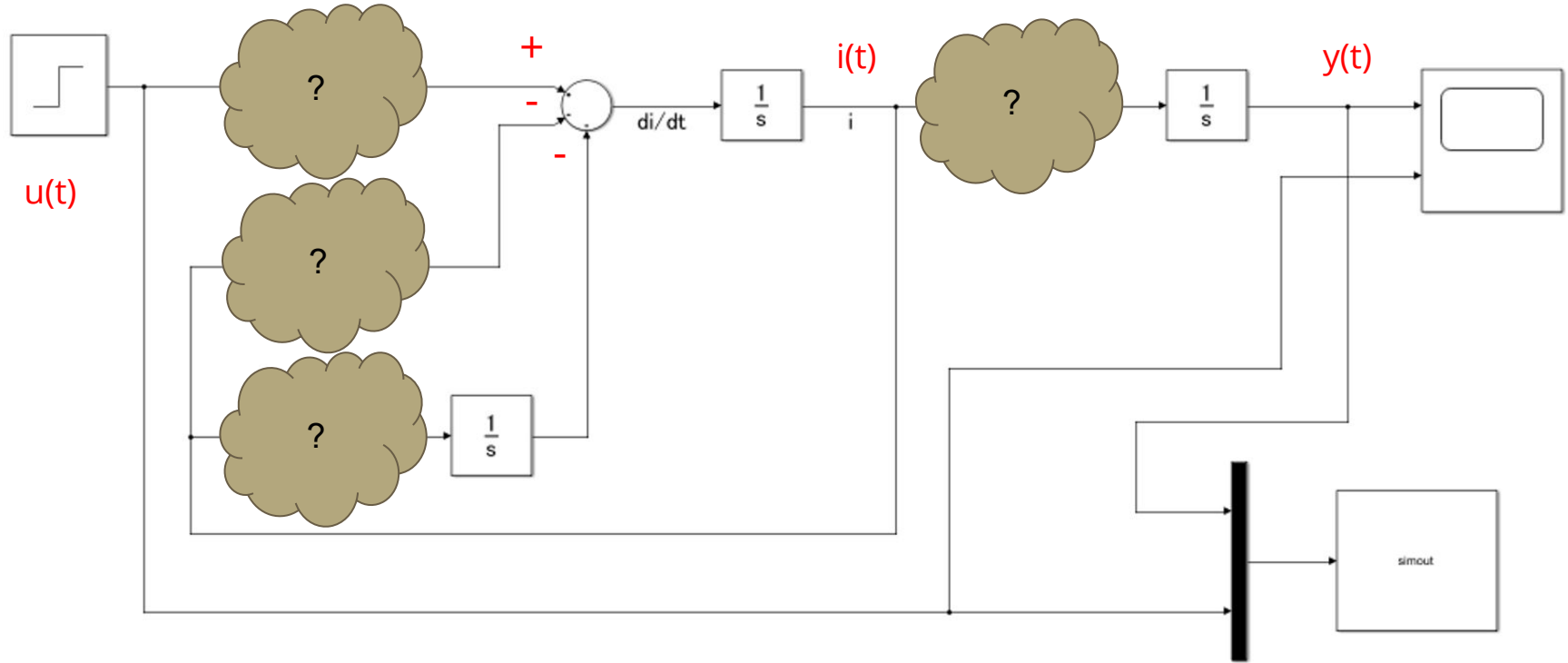


$u(t)$: Input Voltage

$y(t)$: Output Voltage

-> Capacitor Volotage

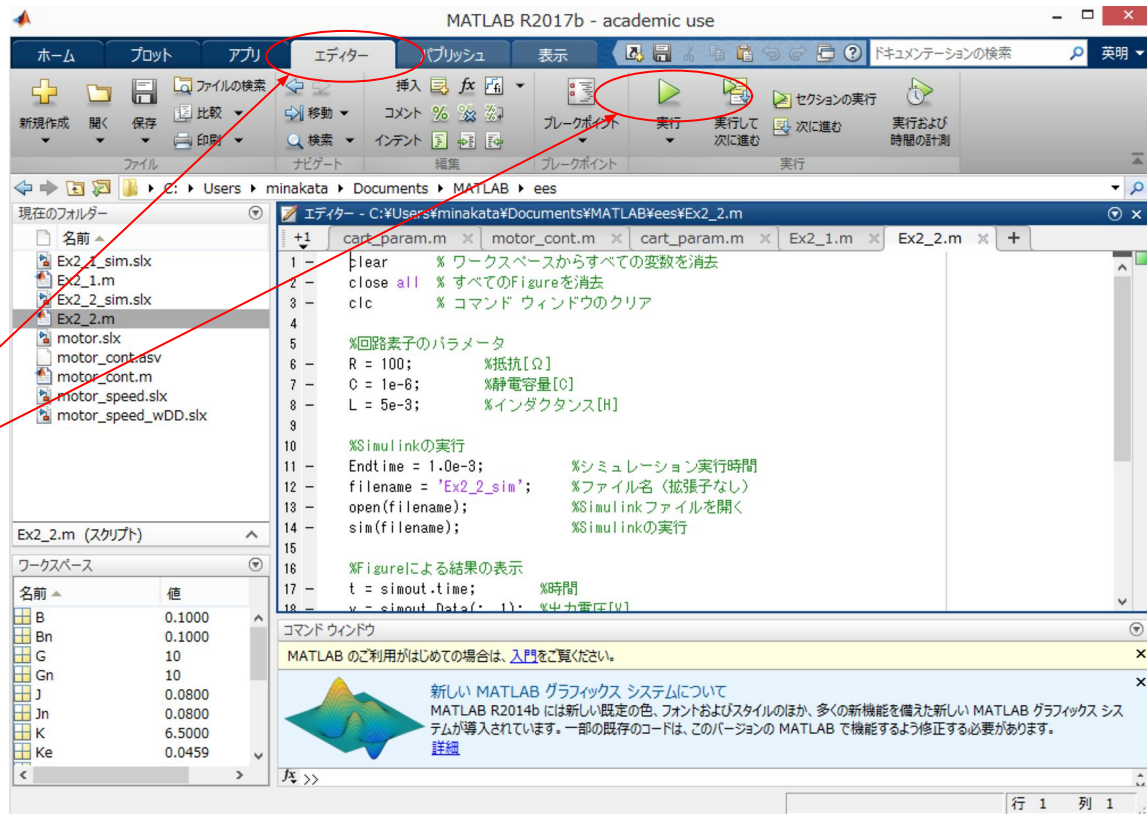
Implimentation



Control Simulations using m.file

Ex2_2.m controls
simulation named
Ex2_2_sim

1. open 'Ex2_2.m'
2. move to 'editor' tab
3. click 'run'



Block Parameters

"Step" Block

Step time: $1e-4$

not 0s, but start with
short delay

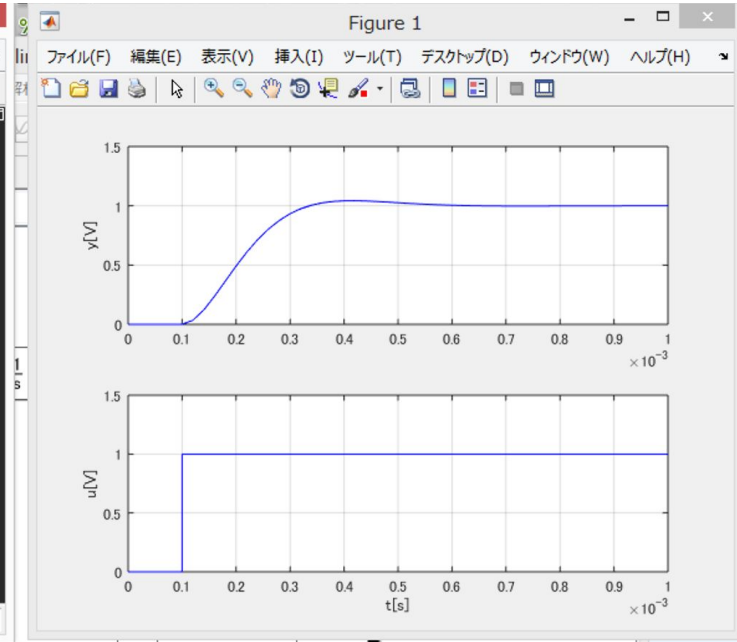
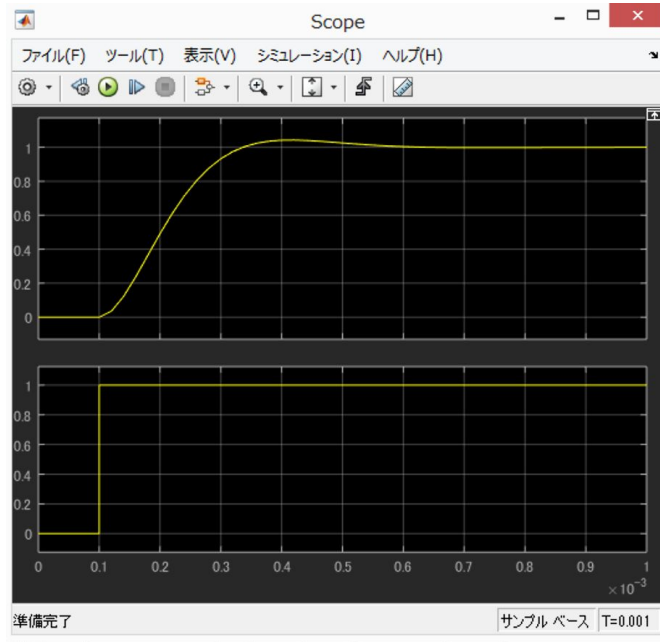


Example Output

$R=100\Omega$

$L=5\text{e-}3\text{H}(5\text{mH})$

$C=1\text{e-}6\text{F}(1\mu\text{F})$



Example Output (small capacitor)

$C=1\mu\text{F}$
 $\rightarrow 0.1\mu\text{F}$

