Ex:

Write a Matlab function called `RCplot` that plots the voltage on a capacitor versus time. Specifically, `RCplot` does the following:

i)   Accepts three input values: `Vzero`, `Vinf`, and `tau` representing the initial voltage on the capacitor, the final voltage on the capacitor, and the time constant in the standard formula for capacitor voltage: $vC = v\inf + (vzero - v\inf)e^{-t/\text{tau}}$

ii)   Test whether `tau` is negative and, if so, prints an error message and returns to the calling program.

iii)   Creates an array called `t` containing time values from 0 to 1 ms (i.e., 0.001 sec) (inclusive) spaced by 1 μsec (i.e., 10^{-6} seconds).

iv)   Creates an array called `vC` containing capacitor voltage for each time in array `t`. (Use the standard formula for `vC`, above.)

v)   Plots v_C versus t as a blue line on an x-y plot.

vi)   Labels the x-axis as "time", the y-axis as "voltage", and titles the plot "Capacitor Voltage".

Sᴏʟ'ɴ:

```
function RCplot(Vzero,Vinf,tau)
% RCplot(Vzero,Vinf,tau)    Plots RC circuit voltage waveform.
%
% Inputs:
%  Vzero = voltage at time zero
%  Vinf  = voltage at time approaching infinity
%  tau   = time constant of circuit

  % Test whether time constant is negative (not allowed).
  if tau < 0
    display('Error: time constant tau is negative--not allowed!')
    return
  end

  % Create a 1 msec time array, with samples spaced by 1 usec.
  t = 0:1e-6:1e-3;

  % Create array of voltages using standard RC solution.
  vC = Vinf + (Vzero - Vinf) * exp(-t/tau);

  % Plot vC versus time.
  plot(t,vC,'b-')

  % Add labels to plot.
  xlabel('time')
  ylabel('voltage')
  title('Capacitor Voltage')
```