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% Worksheet 5, Problem 1
% Part a - naming forward euler function output and input
function yvec = forward_euler(t0,tf,y0,f,nsteps)

% Part b - Calculate uniform stepsize h using initial time t0, final time tf, and the number of steps nsteps. ✓
h = (tf-t0)./(nsteps);

% Part c- Creating placeholder vectors t and y as vectors of zeros with the appropriate dimensions, note dimensions are nsteps + 1 for both ✓
tvec = zeros(nsteps+1,1);
yvec = zeros(nsteps+1,1);

% Part d - Set t(1) = t0 and y(1) = y0.
tvec(1) = t0;
yvec(1) = y0;

% Part e - Forward Euler iterations, Creating the for loop -- follows the approximation
%  $y(t_{n-1}) = y(t_n) + f(t_n)h$ 
for i= 2:(nsteps+1)
    tvec(i) = tvec(i-1) + h;
    yvec(i) = yvec(i-1) + h.*f(tvec(i));
end
```