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% Define the differential equation
dydt = @(t, y) y * t^2 - 1.1 * y;

% Initial condition
y0 = 1;

% Time interval
t0 = 0;
tf = 5;

% Step sizes
h1 = 0.5;
h2 = 0.25;

% Number of steps
n1 = (tf - t0) / h1;
n2 = (tf - t0) / h2;

% Initialize arrays to store results
t1 = zeros(1, n1+1);
y1 = zeros(1, n1+1);
t2 = zeros(1, n2+1);
y2 = zeros(1, n2+1);

% Euler's method with h = 0.5
t1(1) = t0;
y1(1) = y0;
for i = 1:n1
    t1(i+1) = t1(i) + h1;
    y1(i+1) = y1(i) + h1 * dydt(t1(i), y1(i));
end

% Euler's method with h = 0.25
t2(1) = t0;
y2(1) = y0;
for i = 1:n2
    t2(i+1) = t2(i) + h2;
    y2(i+1) = y2(i) + h2 * dydt(t2(i), y2(i));
end

% Plot results
plot(t1, y1, '-o', t2, y2, '-s');
xlabel('t');
ylabel('y(t)');
title('Solution using Euler's method');
legend('h = 0.5', 'h = 0.25');
grid on;

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