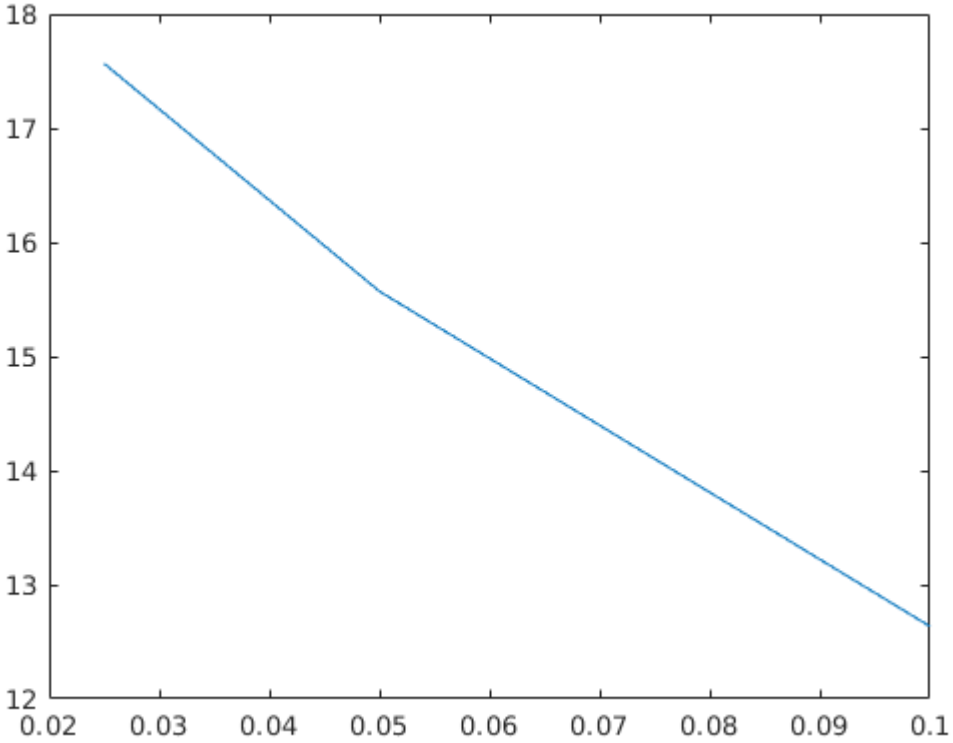
```
% Liam Fruzyna
% MATH 4540
% Assignment 3

format long

% 6.1 2c) Plot the Euler's method approximate solutions for the IVP y' =
% 2(t + 1)y from 0 to 1 for step sizes h = 0.1, 0.05, 0.025 and the exact.

plot([0.1, 0.05, 0.025], [euler(0, 1, 0.1, 1), euler(0, 1, 0.05, 1), euler(0, 1, 0.025,
1)])

function [result] = euler(a, b, h, y0)
    result = 0;
    n = (b - a) / h;
    t = zeros(1, n+1);
    y = zeros(1, n+1);
    t(1) = a;
    y(1) = y0;
    for i=1:n
        t(i+1) = t(i) + h;
        result = y(i) + h * (2 * (t(i) + 1) * y(i));
        y(i+1) = result;
    end
end
```

Results


18
17
16
15
14
13
12
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09
0.1