Use Euler and the Improved Euler methods.

1. Consider the initial value problem $y' = 2xy,\ y(1) = 1.$ Use the Euler's method and improved Euler's method with h = 0.1and h = 0.05 to obtain approximate values of the solution at x = 1.5. At each step compare the approximate value with the actual value of the analytic solution. Also calculate the bound for the local truncation error using the formula: $y''(c)\frac{h^2}{2}, \ where\ x_n < c < x_{n+1}$

2. Consider the initial value problem $y' = (x + y - 1)^2,\ y(0) = 2.$ Use the improved Euler's method with h = 0.1and h = 0.05 to obtain approximate values of the solution at x = 0.5. At each step compare the approximate value with the actual value of the analytic solution.