SIF3012 Computational Physics
2025-2026 Semester 1
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BLOCK 3

Exercise 1
Consider the ordinary differential equation $y'' + xy' - xy = 2x$ with boundary conditions $y(0) = 1$ and $y(2) = 8$. Compute a code that uses the finite difference method with step h=0.5 to obtain the solution for $y(x)$. The code should show as an output the matrix that represents the system of equations. You can use any method to solve this matrix.

Exercise 2
Repeat exercise (1) but using a step of h=0.01. You do not need to show the matrix here.

Exercise 3
Plot the solution for $y(x)$ that you obtained for both Exercises (1) and (2) and compare them.