Assignment 8

Write a MATLAB function with the name `Assignment8_GroupX.m`[1] that solves the following problem. Use local functions or nested functions if required.

(2 Points) Find two eigenvalues λ_i and the corresponding eigenfunctions $y_i(x)$ of the non-linear differential equation

$$y'' + \lambda\, x\, y(1 - y) = 0$$

such that $y_i(0) = y_i(1) = 0,\ y_i'(0) = 0.1$, for $i = 1, 2$. Plot the eigenfunctions.

Hint: Initialize the solution with $y = \sin(\pi\, x)$ and λ with 10 and 100.

[1] `X` is your group number