HW 11

Given the equation $y'' = -(x+1)y' + 2y + (1-x^2)e^{-x}$, $0 \le x \le 1$, $y(0) = 1$,

$y(1) = 2$

use $h = 0.1$

Questions:

a. Use the shooting method to approximate the solution of the problem

b. Use the finite-difference method to approximate the solution

c. Use the variation approach to approximate the solution.

Shooting Method

x	y(x)
0.0	1.000000
0.1	1.016650
0.2	1.059293
0.3	1.124476
0.4	1.209121
0.5	1.310528
0.6	1.426377
0.7	1.554712
0.8	1.693917
0.9	1.842688
1.0	2.000000

Finite Difference Method

x	y(x)
0.0	1.000000
0.1	1.016532
0.2	1.059102
0.3	1.124251
0.4	1.208890
0.5	1.310313
0.6	1.426194
0.7	1.554570
0.8	1.693822
0.9	1.842642
1.0	2.000000

Variation Method

x	y(x)
0.0	1.000000
0.1	1.077733
0.2	1.161040
0.3	1.252998
0.4	1.353218
0.5	1.458855
0.6	1.566690
0.7	1.674796
0.8	1.782838
0.9	1.891205
1.0	2.000000