E94114057 古清賢 HW11

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.

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PS C:\Users\古清賢> & D:/anaconda/python.exe c:/Users/古清賢/Documents/GitHub/E94114057_numerical_hw11.p
   x  Shooting Method  Finite Difference  Variation Method
0.0         1.000000           1.000000          1.000000
0.1         1.016634           1.323203          1.087564
0.2         1.059210           1.596114          1.164409
0.3         1.124314           1.815429          1.250970
0.4         1.209024           1.980210          1.353184
0.5         1.310524           2.091680          1.462172
0.6         1.426232           2.152913          1.568439
0.7         1.554455           2.168458          1.672568
0.8         1.693764           2.143930          1.780864
0.9         1.842715           2.085598          1.893285
1.0         2.000000           2.000000          2.000000
```