INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI

DEPARTMENT OF MATHEMATICS

MA 573: Numerics of Partial Differential Equations

Semester–II, Academic Year 2023-24

Labs – 12

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1. Solve the following BVPs (using any numerical scheme of your choice) and compare the result with its analytical solution

   (a) BVP-1

   $$\frac{\mathrm{d}^2u}{\mathrm{d}x^2} + 1 = 0, \quad 0 < x < 1,$$
   $$u(0) = 0, \;\; u'(1) = 1.$$

   (b) BVP-2

   $$\frac{\mathrm{d}^2u}{\mathrm{d}x^2} + x = 0, \quad 0 < x < 1,$$
   $$u(0) = 0, \;\; u'(1) = 1.$$

   Compare numerical slope of u with the analytical one in both the cases.