

## Assignment 12. Euler Forward, Predictor-Corrector

Marks 10

Posted on 22.10.2025 @ 2:30 pm and due on 22.10.2025 @ 6:00 pm

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1. Use Forward (explicit) Euler and Predictor-Corrector methods to solve and the following differential equations and compare with analytical form over range  $x \in [0, 2]$  and  $x \in [0, \pi/5]$  for the first and the second differential equations respectively. Use step size 0.1 in both the cases.

$$\begin{array}{lll} \frac{dy}{dx} = y - x^2 & \text{with } y(0) = 0 \rightarrow & y(x) = x^2 + 2x + 2 - 2e^x \\ \frac{dy}{dx} = (x + y)^2 & \text{with } y(0) = 1 \rightarrow & \tan^{-1}(x + y) = x + \frac{\pi}{4} \end{array}$$