MECH 663 Computational Fluid Dynamics
Programming Assignment #2

In this assignment, you are requested to extend the code you developed in assignment 1 to include the convection term assuming a known flow field. You are required to implement the upwind scheme and then extend the code to implement the modified SMART scheme following a deferred-correction approach.

Use the developed general code to solve the following problem:

The figure below shows the well-known benchmark test problem consisting of pure convection of a transverse step profile imposed at the inflow boundaries of a square computational domain. Use 30 X 25 elements to solve the problem. Obtain solutions using the upwind and the modified SMART schemes. Compare profiles along the vertical centerline of the domain.