Project 1(a). Student Name: ;Student Number:

Important: Read the instructions in Chapter 7 of your notes.

Propagate the wave given in Figure 1 through a one-dimensional domain of length unity. Write a computer program to solve the 1D scalar convection equation using the numerical method(s) listed below. Solve the problem for different velocity values.

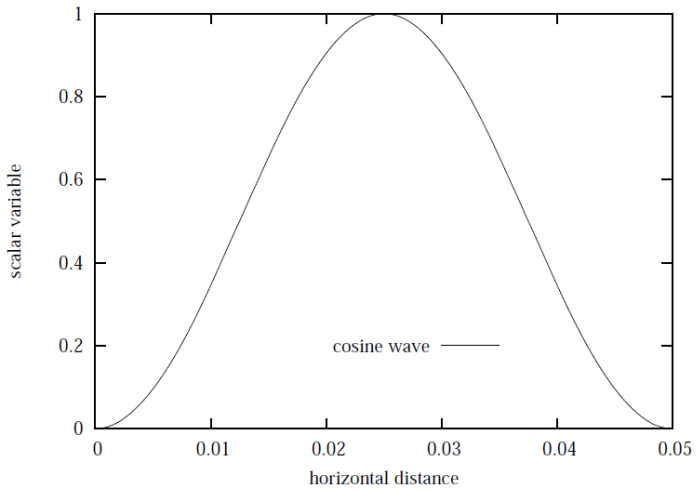

Figure 1 Input to the domain given

Numerical method:

Compare first order explicit and implicit upwind finite difference schemes.

Include the following in the report (see Chapter 7 for instructions to write the report):

(1) Influence of number of nodes on the solution.
(2) Speed of calculation.
(3) Time taken for the wave to leave the domain.
(4) Capture the locations of the wave at various time instances.
(5) List the computer program.

Submission:

Please submit your report via canvas. Thank you.