MATH3201 Practical Session
Week 11

Wave equation in 1D
Write a numerical solver for the wave equation:

$$u_{tt} = c^2 u_{xx}$$

where the wave speed $c = 1$, and $u = 0$ on the boundary of the region $0 \leq x \leq 2$ with initial condition $u(x, 0) = \sin(\pi x/L)$ and $u_t(x, t) = 0$. Space and time steps are $dx = 0.1$ and $dt = 0.05$, respectively.

The exact solution is $\sin(\pi x/L)\cos(c\pi t/L)$.

Plot your numerical solution (open circles) against the exact solution (curve). Label the solutions using Matlab legend.