

# PHYS 325: Computational Physics III

*Winter 2023*

## Exercise 7.1

1. Repeat Exercise 6.2, using the *Lax-Wendroff* method:

$$u_j^{n+1} = u_j^n - \alpha \left[ \frac{1}{2}(u_{j+1}^n + u_j^n) - \frac{1}{2}\alpha(u_{j+1}^n - u_j^n) - \frac{1}{2}(u_j^n + u_{j-1}^n) + \frac{1}{2}\alpha(u_j^n - u_{j-1}^n) \right],$$

where  $\alpha = v\Delta t/\Delta x$ .

By tracking how the peak of the disturbance moves across the grid, verify that the speed is  $v = 1$ , as expected.