solution when $c = -0.5$ is a bit more reasonable, although one can already observe some degradation due to the relatively low accuracy of the scheme. This can be alleviated by employing a smaller step size. The case $c = -1$ looks exceptionally good, and you are asked to provide an explanation in Exercise 5.3.6.

**The CFL Condition**

There are two ways to understand the observed numerical instability. First, we recall that the exact solution (5.36) is constant along the characteristic lines $x = ct + \xi$, and hence the value of $u(t, x)$ depends only on the initial value $f(\xi)$ at the point $\xi = x - ct$. On the other hand, at time $t = t_j$, the numerical solution $u_{j,m} \approx u(t_j, x_m)$ computed using (5.38) depends on the values of $u_{j-1,m}$ and $u_{j-1,m+1}$. The latter two values have