HW4

April 16, 2007

1. Solve $u_t + u_x = 0$ at $t = 2, 4, 6, 8$, $-1 \leq x \leq 1$, periodic boundary conditions, with initial data:

$$u(x,0) = \left\{ \begin{array}{cc} -x\sin(\frac{3}{2}\pi x^2) & -1 \leq x \leq -\frac{1}{3} \\ |\sin(2\pi x)| & |x| \leq \frac{1}{3} \\ 2x - 1 - \sin(\frac{3\pi x}{6}) & \frac{1}{3} \leq x < 1 \end{array} \right\}$$

(a) 1st Order Upwind
(b) Lax-Friedrichs
(c) 2st Order Upwind
(d) Lax-Wendroff
(e) ENO
2. Ex 4.8-4.10,6.1-6.3 in the book