

HW6

May 13, 2009

1. Solve Burgers' equation with $u(x,0) = \frac{1}{4} + \frac{1}{2} \sin(\pi x)$ in $-1 \leq x \leq 1$ with periodic boundary conditions (make sure you use different grid size and observe what happens near shock and in the region of rarefaction) for the following schemes. Print out solution at $t = \frac{2}{\pi}$ and $t = 1.1$.

- (a) Lax-Friedrichs Method in p.125
 - (b) Lax-Wendroff in p.127
 - (c) Richtmyer two step Lax-Wendroff in p.127
 - (d) MacCormack's method in p.127
 - (e) Roe's scheme in (13.22) p.144
 - (f) Godunov's scheme in p.144
2. Exercise 13.2 in the book