

In-class assignment # 11

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Instructions: In today's class we are going to discuss and implement the 2^{nd} order finite-volume solver for Burgers' equation, as discussed in Chapter 5 of Zingale's lecture notes. Test it for two sets of initial conditions, and verify that they behave in agreement with Figures 5.3 and 5.4 in Zingale. In both cases, use a domain that goes from $0 \leq x \leq 1$ with $N_g = 100$ grid points.

Initial condition #1 (rarefaction wave): $u(x, t = 0) = 1$ for $x < 1/2$ and $u(x, t = 0) = 2$ for $x \geq 1/2$

Initial condition #2 (shock): $u(x, t = 0) = 1$ for $x < 1/3$ and $x > 2/3$, and $u(x, t = 0) = 1 + \frac{1}{2} \sin(\frac{2\pi(x-1/3)}{1/3})$ for $1/3 \leq x \leq 2/3$.

As per usual, submit your code, plots, etc. via GitHub!