Relative Error L_2 Table: Classical Method for Inviscid Burgers

0.1 Inviscid Burgers Equation

- The relative error L_2 with initial condition $u_0(x) = -\sin\left(\pi\frac{x}{8}\right)$

Time step Δt \ Relative Error L_2 at T	$T = 2.00$	$T = 1.99$	$T = 1.0$	$T = 0.5$
0.064	9.501×10^{-2}	9.346×10^{-2}	4.407×10^{-2}	2.590×10^{-2}
0.048	9.647×10^{-2}	9.488×10^{-2}	4.248×10^{-2}	2.456×10^{-2}
0.032	9.548×10^{-2}	9.393×10^{-2}	4.290×10^{-2}	2.453×10^{-2}

- The relative error L_2 with initial condition $u_0(x) = \cos\left(-\pi\frac{x}{8}\right)$

Time step Δt \ Relative Error L_2 at T	$T = 2.00$	$T = 1.99$	$T = 1.0$	$T = 0.5$
0.064	8.988×10^{-2}	8.806×10^{-2}	2.978×10^{-2}	1.613×10^{-2}
0.048	9.148×10^{-2}	8.964×10^{-2}	2.665×10^{-2}	1.296×10^{-2}
0.032	9.032×10^{-2}	8.849×10^{-2}	2.759×10^{-2}	1.305×10^{-2}

- Remark: (from course notes: Lax Convergence Theorem) the actual error E^h is converging with the same order as the local truncation error T^h i.e the order of convergence is $q = 2$ in space-time.