Title

Names

INTRODUCTION

Consider the IVP:

Inviscid burgers equation IVP

This is the IVP of the Inviscid Burgers Equation, which is the PDE that we will be studying. The equation is the inviscid limit (limit as ) of the Burgers Equation

Inviscid burgers =

The equation is used to model the formation and propagation of shocks in physical mediums. These are often fluids but the equation can also be applied to more abstract mediums like traffic.

TEST PROBLEMS

For all problems:

-Riemann Problem

-Different choices for and :

-True solution:

where is the speed at which the shock moves.

-Rarefraction

-Different choices for and :

-True solution:

where is the speed at which the shock moves.

-Other random things idk what to call this

-We can take g(x) to be whatever so…

g(x) = x

-x

sin(x)

1/x

NOTABLE FEATURES OF SOLUTIONS TO PDE:

-Poor regularity after the formation of a shock

-They are not always differentiable. At a shock, there is a discontinuity in u(x,t)

-Solutions shouldn’t blow up? I think? Numerical methods should struggle at a discontinuity. If we have a rarefraction wave (no discontinuity), the numerical methods should perform well.

REFERENCES

<https://www.youtube.com/watch?v=4kS_lDTs5p8&t=4s>