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Computational Fluid Dynamics
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Exercise : Solve the Riemann problem

$$q_0(x) = \begin{cases} q_l & x < 0 \\ q_r & x > 0 \end{cases}$$

for the scalar hyperbolic equations

1. $$q_t + x^2 q_x = 0$$

2. $$q_t + \frac{1}{x^2+1} q_x = 0$$

using the method of characteristics and discuss the difference between the solutions found.

Figure 1: *Source: w8themes.com*