1. In the Fisher's equation problem of HW8 you had to increase the coefficient of the nonlinearity (had to make it > 1) in order for the traveling wave to form inside the given spatial domain $x \in [-10, 10]$. You then noticed that the speed of the resulting front was large (larger than 2). In the present problem you will first have to find a book that analyzes traveling waves for Fisher's equation and determine what wave speed corresponds to the new coefficient you used in Fisher's equation (when these coefficients are all 1 the speed is 2). Then re-run your code and produce a table of the mesh size h $vs.$ the observed wave speed. Do you converge to the theoretical wave speed ? what is the rate of convergence ?

2. Do Problem 7.3.9 from the textbook. Use the discussion and algorithm described on pages 177-180 to write your program. The problem asks you to demonstrate the second-order accuracy of the Peaceman-Rachford ADI scheme. The norm of the error with respect to the exact solution at the final time is now over a two-dimensional domain (the unit square). Produce a log-log plot of this error $vs.$ the mesh size h and check the slope.