

Assignment 3. Due Fri., Apr. 22.

Do **problems 4 and 5 on Problem Set 2** in the Notes,

OR

Do **problem 4a on Problem Set 2** in the Notes and program the difference scheme in that exercise for the IBVP:

$$u_t = u_{xx}, \quad 0 \leq x \leq 1, \quad t \geq 0$$

$$u(x, 0) = x(1 - x), \quad 0 \leq x \leq 1$$

$$u(0, t) = u(1, t) = 0, \quad t \geq 0.$$

Try running with  $\Delta t = (\Delta x)^2$  and with  $\Delta t = \frac{1}{2}(\Delta x)^2$  and with  $\Delta t = \frac{1}{4}(\Delta x)^2$ , say, for  $\Delta x = .05$ . Plot the computed solution at time  $t = .1$ . Explain your results.