How to use pplane in Matlab

Download Matlab from

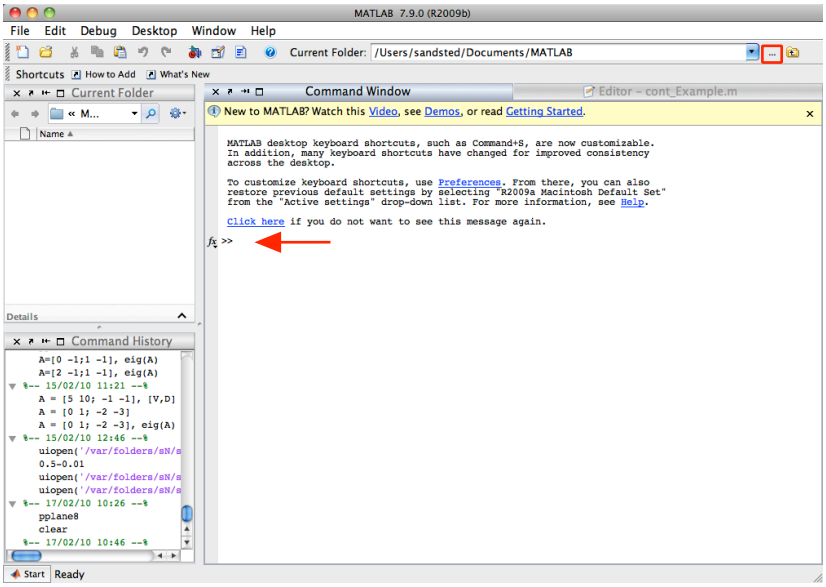
http://software.brown.edu/dist/sw-win.html (Windows)
http://software.brown.edu/dist/sw-mac.html (Mac)

Next, download pplane8 (which has been develped by John C Polking at Rice University) from

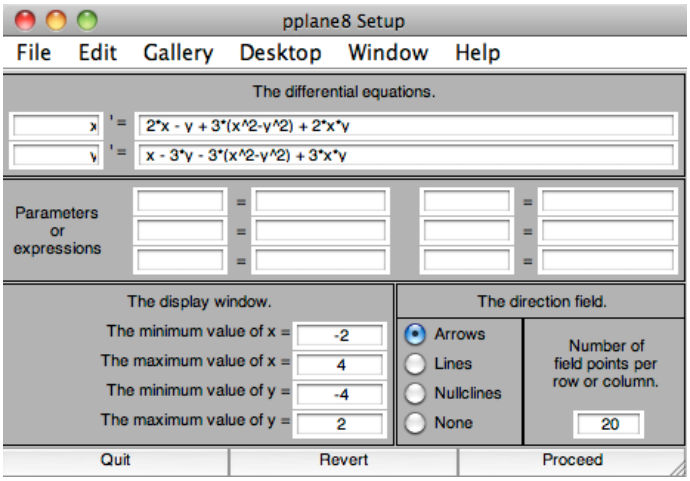
http://www.dam.brown.edu/people/sandsted/APMA1940R.php

and save it on your computer.

Start Matlab, and you will see a screen similar to the one shown below:



Click on the "..." button indicated by the red rectangle in the figure above and change your working folder to the folder in which you saved pplane. Next, type "pplane8" at the arrow in the Matlab window and press enter. The "Setup" window will pop up in which you can enter differential equations in the plane and any parameters that appear in these equations:



To solve the Nagumo system we discussed in class, download the file nagumo.pps from the course website and select

"File -> Load a system..."

from the menubar. Select nagumo.pps, and clicking on "Proceed" will take you to the following "Display" window, which contains the phase portrait of our differential equation.

From the menubar, select "Options -> Solution direction -> Forward" so that pplane solves only in forward time. Then click anywhere in the window to compute the trajectory with the chosen initial condition. Check out the various menus under "Edit", "Solutions", "Options" and "Graph", and try a few of them out. For instance, select "Solutions -> Find an equilibrium point" and use the cross hairs that pop up to select a point. Matlab will find an equilibrium and display its Jacobian and the eigenvalues in a separate window: it will also classify the equilibrium for you, and you can solve the linearization by selecting "Display the linearization". If you now select "Solutions ->Plot stable and unstable orbits", you can select a saddle point, and pplane will compute its stable and unstable manifolds.