Checklist for Delta/Az HW

1a) Input file with 8 test locations at 45° delta, every 45° of azimuth around earthquake on equator and prime meridian.

1b) Input file with 8 specified test locations around an earthquake in Memphis

These input files should ideally be text files, not a mat file (which requires another program to produce).

2) Script that reads each of the two input files and prints out the results (lats and lons of the eq and stations, deltas – in degrees, and azimuths – in degrees). When locating an earthquake from one station, you need the back-azimuth, so the “azimuth” reported should be the back azimuth. The easiest way to get the back azimuth is to switch the order of the stations and earthquake in the call to the function. This means your code has to figure out which input, the first or second set of lats and longs, needs to get repmat-ed. Your script should use functions in the script to do duplicated tasks such as checking the data (stations and earthquake for both data sets). Since the azimuth calculation needs the delta, you could do both delta and azimuth in one routine (MATLAB has a distance and an azimuth routine, but the distance routine can do both), OR have separate routines – BUT if you have separate routines, you don’t need to repeat the testing or the code for delta in the azimuth routine – when you enter the azimuth function call the function for delta first as that has the test in it. This saves lots of repetitive coding, makes debugging easier, and runs faster since you are not doing stuff twice.

3) Your script should check all the input data, stations and earthquakes. If you are reading in mat files or files with only numbers being read in as numbers, you don’t have to check for non-numeric data (in the latter case the read routine will catch non-numeric characters).

4) Check your results against MATLAB’s distance function. It is a one liner to use the MATLAB distance function to get both delta and azimuth (it can return both and is vectorized).

When I get your submission, I should be able to go to the directory where I stored your files and run the m-file script getting an output showing the inputs, deltas and azimuths (both in degrees). If you need help ask, me or other students, but do it yourself.