

CE640 / OC512 Matlab  
Homework 5 – graphics...

There are 12 files with your assignment. These correspond to the monthly precipitation amounts (I believe in mm...). They are in ESRI ASCII format (see [http://en.wikipedia.org/wiki/Esri\\_grid](http://en.wikipedia.org/wiki/Esri_grid) for complete description). The data are for one particular year.

I would like you to write a single mfile that will load in these files, do some analysis, make one pretty figure, and one animation. Below is a specific list of what I want your code to do. Beyond the suggestions / requirements below, you have the freedom to do whatever you want! Make it good...NOTE: when you submit your assignment, please zip up your .m file AND the 12 grids. I should be able to just download and run your code.

1. I would like your mfile to ‘automate’ (avoid hard coding) the task of reading in all the files. You can do this with a loop, several ways. One way is that, as you can see the file names are all pretty similar, except for 01, 02, 03, ..., 12. So, you can use a for loop where you construct the file names one at a time and open the correct file each time through the loop. A complicating factor is the leading 0 for months Jan through Sep. You will have to work out a solution for that. Another option? HINT: the dir function is amazing here. If you do

```
>> var = dir (*.asc')
```

it will save all of the file names in your folder into a structure called var. Then, var(1).name will allow you to get the name of the first file, var(2).name, and so on...so you can see how in a loop you can cycle through all of the files and open them one at a time!

2. To load an individual data file, you could use what you know about file i/o. Obviously, there is some header stuff, then the main data block. The header is key, as it tells you the LL corner coords, the cell size, and the array dimensions. So, you should be able to, based upon that information, plot up the data in some suitable way, with proper axes, and axes labels. But, you are in luck. Since the ESRI ASCII format is super popular, Matlab has a built in ‘arcgridread’ function. I recommend you explore this option as an easy way to get your data read in, and to obtain coordinate information that will allow you to make a nice plot, with correctly formatted and labeled axes.

3. Main product: I would like you to make a high-quality figure (pcolor, image, mesh, surf, whatever you decide) that shows the annual total precipitation over the domain. Use a ‘top view’ for the figure and not a ‘perspective view.’ Adjust the colormap to be whatever you feel looks best. In addition to the image, I would like you to add contours at select intervals (you decide on how many, and at what levels). Insert title, colorbar, and / or anything else you feel maximizes the impact and clarity of the

figure. Use a 'print' command at the end to print out a 300 dpi .png file. Adjust the figure size so that your output is attractive.

zip your .m file together with the 12 .asc files and upload the zipped file. Thanks!