

ESCI7205 hw4

Due Thu., Oct. 8, 2009.

1) read the three AWK articles linked on the web page under the title “texts”.

2) We will now continue making some maps. Say you are interested in keeping up to date with earthquakes that occur around the world. Someone has told you that “The Advanced National Seismic System” (anss) and the “National Earthquake Information Center” (neic) has a web page with a “combined earthquake list” that reports earthquakes that have occurred during the last two weeks.

We are going to try and make this be “realistic” in the sense that it is something you might actually have to do.

a) Find the page described above. You will see a link for the data and another link that describes what is in the ascii data file. Do not use the “more readable format” version of the file. When you get to the page with the data you will see a cryptic list of earthquakes. The URL (Universal Record Locator) will look like this

ftp://address/path/filename

Notice that the URL does not start with http:, but with ftp:. (ftp stands for “file transfer protocol”). This means that you are connected to an ftp server. This also means that you can automatically get that file using the ftp program of unix.

- Address: is the host name (or IP address) – for alpaca it would be “alpaca.ceri.memphis.edu”

- Path: everything between the end of the address and the final entry. This is a path through directories. It may be empty.

- Filename: the part after the last “/”

What is the

Address:_____

Path:_____

File name:_____

b) Using your favorite editor create a shell script to get this file. Here is a template for the script. Note that it reports the name of the file it saved.

```
#!/bin/sh
anssfile=filename
ftp -n address << END
user anonymous your email
cd path
get $anssfile
quit
END
echo $anssfile
```

You will have to fill in the stuff in bold italics.

c) After creating this script, run it and make sure you get the file in your directory and it looks like what you saw on the webpage.

3) Now we are going to make a map of this data. Make a “world” map in a Mercator projection between $\pm 60^\circ$ (you can’t go to ± 90 as they are at $\pm \infty$ in a Mercator projection). A template for this file is below. You will have to fill in the blanks.

Notice that I have made a bunch of useful shell variables for colors, the control of the postscript file header, continuation, and footer, and the output file name. You will have to replace the ***bold italic parts of the shell script with the appropriate shell variables, etc.***

a) Plot the earthquakes in magenta. This will require some processing of the input data file using `nawk`. Read the link that describes the `ascii` file (not the more easily readable file) and use that information to write a single line `nawk` program to produce an output data format that can be piped into `psxy` (which basically wants lines with longitude and latitude separated by a space or comma).

[If you really want a challenge – using the same data file – plot the earthquakes from the last 24 hours in magenta, and those from the preceding 13 days in cyan. Depending on how you decide to calculate yesterday - you may find the program `/gaia/home/rsmalley/gg/kf/bin/doy` useful.]

b) Plot the plate boundaries in red for ridges, green for transform, and blue for trenches, using the files `~rsmalley/ptect/ridges`, `xforms`, and `trenches` respectively.

c) Why did we plot the plate boundaries last?

d) What does the `M$` mean in the `psxy` calls to plot the plate boundaries?

```
#!/bin/bash
#the following line allows you to find the plate tectonics data files in my directories.
ROOT=~rsmalley
#echo $ROOT
REGION=_____
PROJ=-Jm0.05

#define some useful shell variables
RED=255/0/0
BLUE=0/0/255
GREEN=0/255/0
MAGENTA=255/0/255
CYAN=0/255/255

MOREPS=-K
CONTINUEPS="-K -O"
ENDPS=-O

OUTFILE=$0.ps

#done with setup, not make map

pscoast -R$REGION $PROJ -G200 -B30g15 -W1 ps-control -X4.8 -Y3.6 -Dl -U output

#now get the data
put your ftp shell script in here to get the latest data and the name of the data file

#now plot the data (psxy wants a list of longitudes and latitudes, one set per line)
use nawk to process the file you obtained in the last line and pipe it into gmt | psxy -
R$REGION $PROJ -Sc0.1 -Gcolor -L ps-control output
```

#now plot the plate boundaries.

#ridges

psxy -R\$REGION \$PROJ -M\$ -W3/*color ps-control ridges-file output*

#transforms

psxy -R\$REGION \$PROJ -M\$ -W3/*color ps-control transforms-file output*

#trenches

psxy -R\$REGION \$PROJ -M\$ -W3/*color ps-control trenches-file output*
