Lightning strikes June 6th over the Puyehue volcano, over 500 miles south of Santiago, Chile. (Francisco Negroni/Associated Press/AgenciaUno)

Chaining and nesting commands

Lecture #5 - COMP 364
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Snapping commands together

- Output & input redirection

- Pipes

- Executing multiple commands in sequence

  - Using the semicolon

  - Batch files

Output redirection

- ls -1 ~/Projects > projects.list

- egrep -o "^[[:space:]]*gene[[:space:]]+[[:digit:]]+\.\.[[:digit:]]+" > ~/Ecoli/genes.txt

- Exercise:

  - I have an address book file called *address.txt*. Each line has the format: *LName, FName, Street, City, Province, Zip*. How do I store all the names (and only the names) into a file called *names.txt*?

Input & output on the command line

- *Standard out*: almost everything that is printed as a result of executing a command

- *Standard error*: the error text that is printed when something bad happens (or you did something wrong). The redirection operator we just learned doesn't capture standard error.

- *Standard in*: an opportunity to input text by hand into a command.

    - Standard in is often expected if you don't specify a file for a command that expects one. Type *ctrl-D* to indicate that you're done entering text.

    - *egrep -o "H."*

    - How would I use *cat* to store a bunch of text into a file called *foo.txt*?

Complete output redirection

- Use "&>" to redirect **all** output to the file designated.

- ls -1 -a5 &> log.txt

Input redirection

- The "<" operator feeds the contents of a file to a command via standard input

- *egrep ".*html" < files.txt* - this egrep command operates on the contents of files.txt

Pipeline exercises

- "|" makes the output from one command the input for another. (Standard out is "piped" into standard in)

- ls -1 | wc -l

- How would you count the number of characters in the first 13 lines of file *data.txt*?

- How would you store in *genes.txt* a list of all files in a directory that start with the word "gene", followed by a number between 200 and 300 (inclusive), and carries the extension ".fasta"?

- When would you use input redirection over pipes?

Semi-colons: executing multiple commands

- A semi-colon acts like a *return* at the end of a line.

- cp foo.txt bar.txt; cat bar.txt - copies the file, then prints it out

- rm -rf backup/hsapiens; cp -r hsapiens backup

Batch files

- A file that executes a series of commands

- Can take arguments from the command line

- Good for:

  - Doing complex tasks

  - Capturing common tasks

```
#!/bin/sh
egrep "^[[:space:]]*gene[[:space:]]+[[:digit:]]+\.\.[[:digit:]]+$" $1
```

Example batch files

```
#!/bin/sh
egrep "^[[:space:]]*gene[[:space:]]+[[:digit:]]+\.\.[[:digit:]]+$" $1 > $2
```

```
#!/bin/sh
egrep "^ORGANISM[[:space:]]+" $1
echo -n "File size: "
wc -c $1
echo -n "Number of genes: "
egrep -c "^[[:space:]]*gene[[:space:]]+[[:digit:]]+\.\.[[:digit:]]+$" $1
```

1. Note: you need to make a script executable
2. Command to execute a script: ./<script name>