Slide 1

Administrivia

- Homeworks 3 and 4 on Web; due next week (Monday and Wednesday respectively).

Slide 2

Shell Programming — Review

- Input to many/most shells forms a programming language, with variables and constructs for selection and repetition.
- Can type these on the fly, or save in file as “shell script”.

Slide 3

Arithmetic

- Most basic/portable way probably `expr`. Example: `n=‘expr $n + 1‘`.
- In `bash`, can also use double parentheses. Example: `n=$((n + 1))`.
- (But if you're doing significant calculations, you should probably be using some other tool — `awk`, `bc`, `dc`, or a program in a "real" programming language.)

Slide 4

Reading from Standard Input

- To read from shell's / script's standard input: `read`. Example:

```
echo "Do you really want to do this?  (y/n)"
read ans
if [ ".$ans" = ".y" ] ....
```

Slide 5

“Here” Documents

- We talked about redirecting input and output. One more option for input, useful in scripts, is to get it from the script itself — “here” document. Example:

```
#!/bin/sh
mail -s "a subject" bmassing << EOF
hello
I am here
who are you?
is this fun?
EOF
```

Slide 6

Other Useful Things

- `getopt` — process command-line options (to help you write scripts that accept options in any order, in the same way most UNIX commands do).
- Remember `pushd` and `popd`, for temporarily changing to another directory and coming back.

Slide 7

Shell Script Examples

- Script to rename all `.htm` files to `.html` (or something similar). `basename` may be helpful.
- Script with a recursive function to compute factorial.
- Other examples as time permits — something else you would find useful . . . ?

Slide 8

Minute Essay

- Tell me something you've learned from this class so far that was useful and/or interesting.