

# CS-344 - Unix Operating System Fundamentals

Lecture 7  
Specifying Instructions to the Shell,  
&  
Printing Files

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Based on slides created by  
Dr. Bangalore for the  
Spring 2005 offering of  
the course

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## Declaring and Using Variables in the Shell

- Declaring Variables: `variable_name = value`
- Display Variables: `echo $variable_name`
- Examples:
  - a = Hello
  - b = date
  - \$b
  - c = `date`
  - d = "You are currently logged on to `hostname`"
  - e = "Today's date is: \$b"
  - f = "Today's date is: \$c"
  - echo \$e \$f

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## Overwriting Existing Files

- ❑ When output is redirected to a file, if the file already exists it's overwritten.
- ❑ To avoid overwriting existing files set the noclobber variable: `set -o noclobber`
- ❑ When noclobber variable is set, the shell complains that the file exists
- ❑ To overwrite a file when noclobber variable is set, use `>!` instead of `>` for output redirection
- ❑ Example: `date >! filename`

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## Avoiding Accidental Removal of Files

- ❑ Unlike Windows, in UNIX when files are deleted they cannot be undeleted
- ❑ `noclobber` feature is an instruction to the shell not to the UNIX commands (e.g., `cp`, `mv`, `rm`)
- ❑ To avoid accidental removal of files use `-i` option with `cp`, `mv`, `rm`
- ❑ set alias for `cp`, `mv`, `rm`, etc. to avoid using `-i` every time that you use those commands
  - `alias rm='rm -i'`
  - `alias cp='cp -i'`
  - `alias mv='mv -i'`
- ❑ To override an alias use `"\command"` instead of command (e.g., `\rm filename`)

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## Redirecting Error Messages

- ❑ Utilities write to the error stream when an error occurs during their execution
  - `ls -l filename` (if the filename does not exist or the file permissions are not sufficient)
- ❑ We have seen output redirection using `>` and `>>`. To redirect error messages use `>2` or `>>2` (in bash)
- ❑ The shell assigns `1` for the standard output stream and `2` for the standard error stream (`>` is same as `>1`)
- ❑ To redirect both error and output together use `>>&1` after the filename
  - `ls -l myfile xyz > outerr >>&1`

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## Local & Environment Variables

- Use "export variable\_name"
  - a=Hello
  - export a
  - export b=World
  - export PATH=\${PATH}::~~/bin
- Remove variable - unset
  - unset a
- List all variables - set
- List environment variables - env

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## Miscellaneous

- view: similar to vi with the read-only flag set
- split: split long files into smaller files
  - split -l linecount filename suffix
  - split -20 longfile file+

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## Printing

- lp: printing files (also lpr -P)
  - lp -d printername filename
- lpstat: check printer status (also lpq -P)
  - lpstat -d printername
- cancel: to remove jobs from print queue (also lprm)
  - cancel jobid
- to remove control characters from a file send to the printer use: col -bx
  - cat filename | col -bx | lp -dprinter

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## Pagination of files with pr

- pagination based on number of lines:  
`pr -l lines filename`
- customize page headers:  
`pr -h 'My Header' filename`
- numbered listing: `pr -n filename`
- skipping pages: `pr +npages filename`
- Output multiple files side-by-side:  
`pr -m file1 file2` (lines that does not fit are truncated)

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## Locating Files (find)

- Locate each file with a specific file-name and display its pathname.
  - `find ~ -name file-name -print`
  - `~` → starting directory (in this case the user's home directory)
  - `-name` → find all files with the specified name `file-name`
  - `-print` → output the full path name for each match.

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## Installing software

- Steps involved:
  - Download
  - Configure
  - Make
- Download and install Apache ant software
  - Download tar gzip file from:  
<http://government-grants.org/mirrors/apache.org/ant/source/apache-ant-1.6.2-src.tar.gz>
  - Copy this file to one of the blazer machines
  - Install the software in your home directory
  - Add "ant" to your path
- To recover the files of a gzip/tar file:
  - `gzip -dv apache-ant-1.6.2-src.tar.gz`
  - `tar -xvf apache-ant-1.6.2-src.tar`

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