CS 246 - Object Oriented Programming **Fall 2016**

Lecture 1: September 8, 2016

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1.1 Administrative Information

Lecturer : **Brad Lushman**
Office : **DC 3110**
Note : **Linux is required in this course**

1.1.1 Grading

- Assignments : 40 % (7% , 7% , 7% , 7% , 12%)
- Midterm : 20 %
- Final : 40 %

1.1.2 Options

- Work in the Lab
- Install linux on yoru personal computer
- SSH into the school machines
- Cygwin - linux environment for windows

Also : Install a XWindows Server.

1.1.3 Modules

1. Linux Shell (2 Weeks)
2. C++ (10 Weeks)
3. Tools (Throughout Term)
4. Software Engineering (Throughout Term)

1.2 Module 1 : Linux Shell

Definition 1.1 *Shell - An interface that allows the user to interact with the operating system.*

Note

Make sure you are running the correct shell. Confirm by typing `echo $0`. Result should be Bash

1.2.1 Linux File System Commands

- Cat - Displays the contents of a file
  - Example Usage : Cat `File Path`

Additional Information

A directory is a special type of file.

- ∧ C (Control + C) : Stop application
- ls : List the files in the current directory
- ls -a : List all files in the current directory
- pwd : Prints the current directory
- ∧ D (Control + D) : Sends EOF signal

What happens if you just type cat?

If you just type Cat, the shell will print everything you type

1.2.2 Output Reduction

- In General : args > file

Executes command args and captures the output in file instead of sending output to screen

1.2.3 Input Redirection

- In General : args < file

Takes contents from file and uses it as keyboard input for args

1.2.4 Differences

- cat infile.txt : Parses the fie name infile.text as an argument to cat. Cat opens the file and displays the contents
- cat < infile.txt : The shell opens the file and parses contents to cat in place of keyboard input.

You can do both

```
Cat < in.txt > out.txt
```

1.2.5 Basic globbing patterns

* is a basic globbing pattern.Shell finds all files in the current directory that match the pattern and substitutes them onto the command line

1.3 Streams

Every Process is attached to three streams

1. stdin
2. stderr
3. stdout

1.3.0.1 By default

- stdin = keyboard
- stderr and stddout = Screen

1.3.0.2 Redirect

- stdin <
- stdout >
- stderr 2 >

1.3.1 Why is stderr seperate?

- So that output and error messages can go to different places
- So that error messages don't corrupt the formatting
- Also, stdout may be buffered

1.4 Pipes

Pipes allow for the output of one program to be used as input (stdin) of another program

Examples

How many words occur in the first 20 lines of myfile.txt

- head -20 file.txt | wc -w

Suppose wonder*.txt contains a lisr of words. Output all unique words

- cat wonder*.txt | sort | uniq

1.4.1 Variables

Example

echo ”Today is $ (date) ”

Shell executes the function within the variable and subsitues he result into the command line.

- Shell doesn’t parse variables in single quotes
- Both quotes will suppress globbing

1.5 Pattern Matching

Syntax : `egrep pattern file`
Action : Prints every line in file that contains pattern

Patterns

- ”CS246||cs246” : One or the other
- **”(cs|CS)246” : Alternate method**
- ”(c|C)(s|S)246” : Combination of options
- **”[cC][sS]246” : Alternate Method**
- ”[...]” : Any character between
- ”[∧...]” : Any character except what is inside
- ” ?” : 0 or 1 occurrence of previous character
- ” *” : 0 or more occurrence of previous character
- ”.” : Any one character
- ”.*” : Anything
- ”+” : 1 or more occurrence
- ”∧$” : Beginning and End of the line

1.6 Permissions

Additional Information

`ls -l` gives a long form listing of files.

1.6.1 Groups and Types

1.6.1.1 Groups

- A user can belong to one or more groups
- A file can be associated with one group

1.6.1.2 Types

A file can be a directory or ordinary file

1.6.2 Changing Permissions

Syntax : `chmod mode file`

1.6.3 Mode

The mode consists of the user type, operator, and permissions.

1.6.3.1 User Types

- u : User
- g : Group
- o : Other
- a : All

1.6.3.2 Operator

- + : Add
- - : Subtract
- = : Set Exactly

1.6.3.3 Permissions Values

- r : Read
- w : Write
- x : Execute