Resolving Path Shortcuts

What to Do?

- Convert pathnames to common interface
  - Absolute pathname
- Different ways to access files
  - Relative to root directory (/)
  - Relative to current directory (.)
  - Relative to previous directory (..)
  - Relative to $HOME (~)
  - Relative to $PATH

Relative to Root Directory

- Absolute pathname, starts with a ‘/’
- $PWD = /home/faculty/cop4610t
  - /bin/bash

  => /bin/bash
- Nothing to convert

Relative to Current Directory

- Default case
- Can occur anywhere in the path
- $PWD = /home/faculty/cop4610t
  - ./lectures/path_resolution.pdf
  - lectures/path_resolution.pdf

  => /home/faculty/cop4610t/lectures/path_resolution.pdf
- Can just ignore ./
  - Exception is when executing commands...

Relative to Previous Directory

- Access parent directory Can
- occur anywhere in path
- $PWD = /home/faculty/cop4610t/public_html
  - ../assignments

  => /home/faculty/cop4610t/assignments
- Use ../ to signal removing the last directory off of the current working directory
  - Take note of root directory...

Relative to $HOME

- Used to quickly access home directory Can
- only occur at start of path
- $PWD = /home/faculty/cop4610t/lectures
  - ~/assignments/project1

  => /home/faculty/cop4610t/assignments/project1
- Expand ~/ to value of $HOME

Relative to $PATH

- Only used for commands
- $PATH = /bin/:/usr/bin/
- $PWD = /home/faculty/cop4610t
  - ls

  => /bin/ls
- If pathname satisfies both of the following:
  - Is a command (not a regular argument)
  - Does not contain any /'s
- Then you need to try each path in the $PATH

Relative to $PATH

- $PATH
  - ~/bin/git/:/usr/kerberos/bin:/usr/local/bin:/bin:/usr/bin
- Need to split by ':' delimiter
  - ~/bin/git/
  - /usr/kerberos/bin
  - /usr/local/bin
  - /bin
  - /usr/bin
- Concatenate items in $PATH with the provided pathname
  - May need to convert these into absolute pathnames first (e.g. ~/bin/git)
- Test each until there is a match that is a regular file
  - Execute first match
  - If all fail, notify user

When to Convert the Paths?

- External commands
  - Expand the command
  - Do not expand the arguments
- Built-in commands
  - Do not expand the command
  - Expand the arguments

Utility Function Ideas: Pathing

- Expand previous
  - Remove trailing directory from passed in path
- Expand home
  - Gets value in $HOME
  - Attaches it to passed in path
- Expand path
  - Gets value in $PATH
  - Tests each with passed in path
- Get current working directory
  - Gets value in $PWD

Utility Function Ideas: Strings

- Split
  - Breaks a string into an array of strings
  - Delimited by a character or string separator
- Concatenate pathnames
  - Combines two strings into one
  - Separated with '/' (may be included in first string...)

Utility Function Ideas: File Checking

- Exists?
  - Check if passed in file exists
- File?
  - Check if passed in file is a regular file
- Directory?
  - Check if passed in file is a directory file