

Files

&

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Command Line

<https://powcoder.com>

(aka Shell)

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Shells

```
$ gcc -Wall -g -std=gnu99 -o hello hello.c
```

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- The \$ is a shell prompt.
- Shells <https://powcoder.com>
 - accept commands (programs) as input
 - finds the executable
 - interprets the arguments
 - starts executing the command
- Shells also have some “built-in” commands.

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Running a program

```
$ gcc -Wall -g -std=gnu99 -o hello hello.c  
$ hello
```

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- load a program into memory and hand it off to the OS to run the program.

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Files and Directories

- “Everything is a file.”
- Unix provides a file interface for all Input/Output.
 - regular files
 - directories
 - devices
 - video
 - keyboard
 - sound
 - network
- File interface = open, read, write, close

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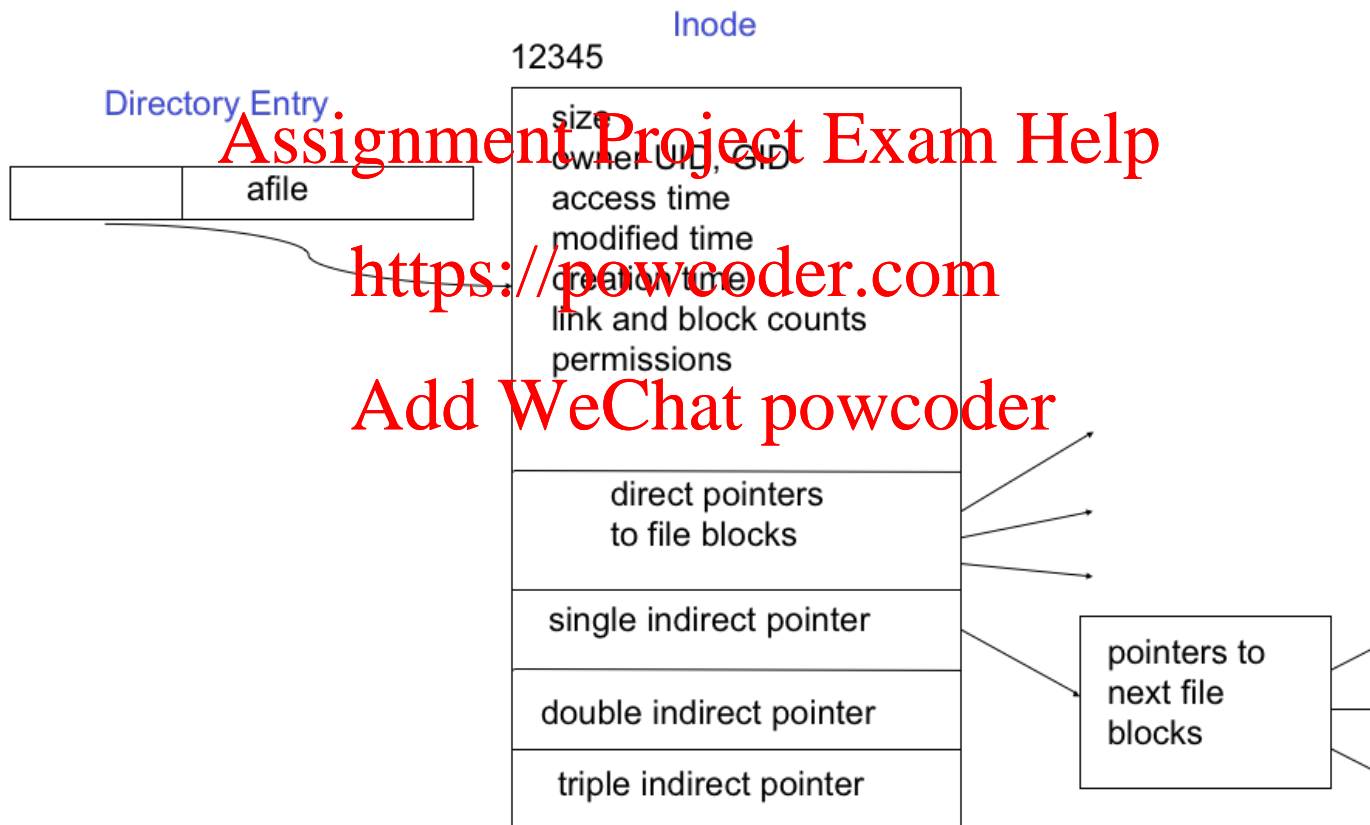
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File System Hierarchy

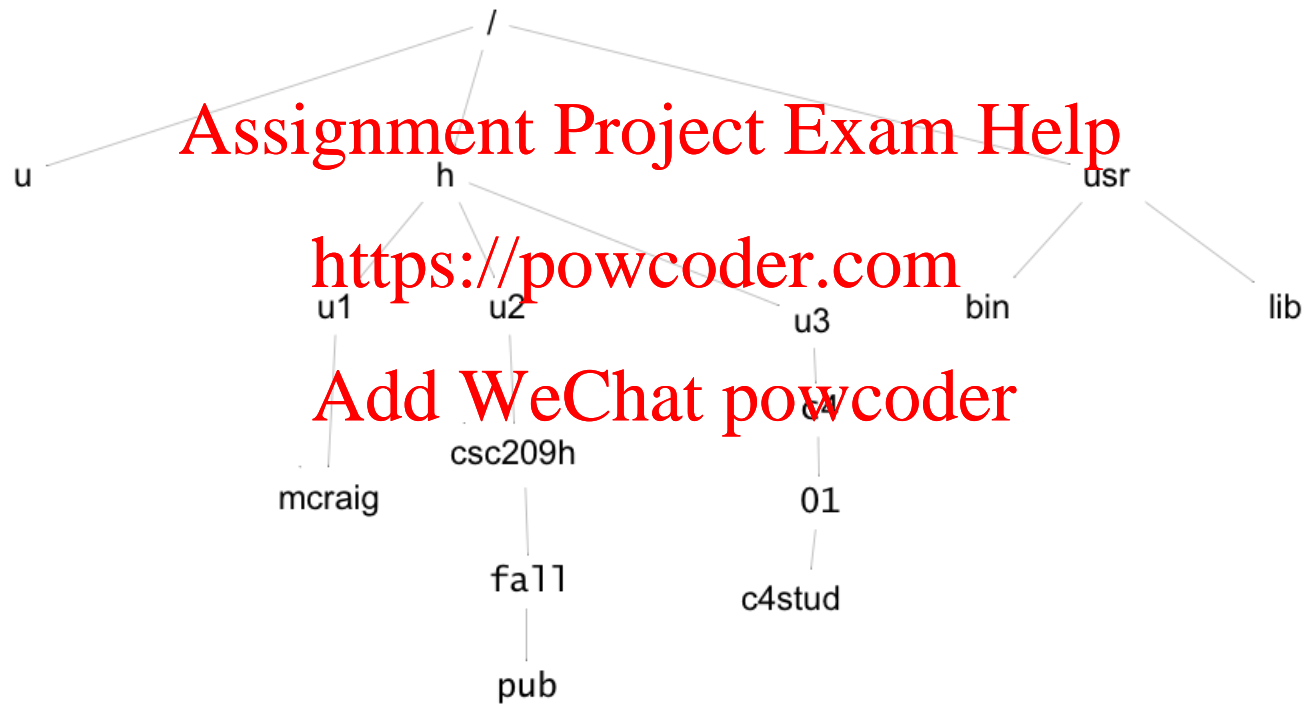
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- Everything starts in the “root” directory whose name is “/” <https://powcoder.com>
- A **directory** is a file that contains directory entries.
- A directory **entry** maps a file name to an **inode**.
- An inode is the data structure that contains information about a file, including which disk blocks contain the file data.

Inodes and Directory Entries



File System Hierarchy



Directories and Links

directory file

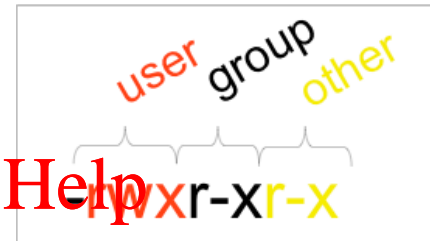
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```
% ls -l /
drwxr-xr-x  2 root  root  4096 Nov  8 17:56 bin/
drwxr-xr-x  2 root  root  4096 Aug 10 14:46 cdrom/
drwxrwsr-x  2 root  staff 4096 Feb  8 2002 home/
drwxr-xr-x  6 root  root  4096 Sep  2 15:26 lib/
lrwx----- 1 root  root      6 Sep  2 15:32 u -> /cdf/u/
```


Permissions



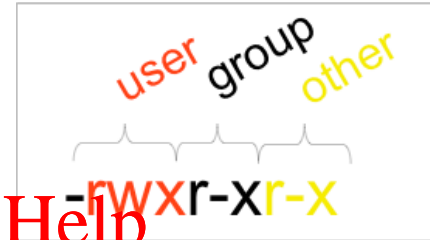
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- File permissions
 - read, write, execute – pretty much what you think
- Directory permissions
 - read – you can run ls on the directory
 - write – you can create and delete files in the directory
 - execute – you can “pass through” the directory when searching subdirectories.

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chmod



- `chmod <file name>`
 - 3 numbers between 0 and 7, the octal value for that category of user
 - Quiz — what is the command to set the permissions of the file classlist to be world readable but writeable only by the file owner and members of the group.
- Another approach
 - `chmod u+rwx`
 - `chmod go-x`
 - adds or removes permissions for those categories of users

Globbering

- A little like regular expressions but different syntax
- * matches any number of any character
- ? matches any one character
- [list of characters]
- [1-5] or [a-z] or [a-xz]