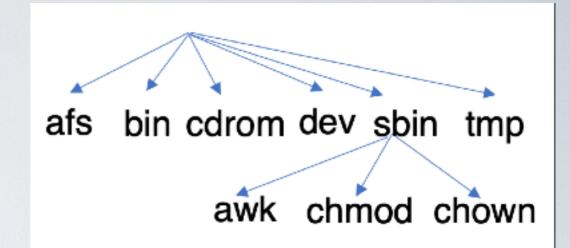
## Hierarchical Directory

→ Used since CTSS (1960s)
Unix picked up and used really nicely

Directories stored on disk just like regular files

- Special inode type byte set to directory
- User's can read just like any other file
- Only special syscalls can write
- Inodes at fixed disk location
- File pointed to by the index may be another directory
- Makes FS into hierarchical tree
- ✓ Simple, plus speeding up file ops speeds up dir ops!



```
<name,inode#>
<afs,1021>
  <tmp,1020>
  <bin,1022>
  <cdrom,4123>
  <dev,1001>
  <sbin,1011>
...
```

# Naming Magic

#### **Bootstrapping**

Root directory always inode #2 (0 and 1 historically reserved)

#### **Special names**

- Root directory:"/"
- Current directory:"."
- Parent directory: "..."

#### Some special names are provided by shell, not FS

- User's home directory: "~"
- Globing: "foo. \*" (expands to all files starting "foo.")

### Using the given names, only need two operations to navigate the entire name space

- · cd name : move into (change context to) directory name
- 1s: enumerate all names in current directory (context)