【Linux Programming】Day8

Class	Understanding Linux/Unix Programming
Date	@May 11, 2022

【Ch3】Directories and File Properties

3.4.3 How do I read a Directory?

The following manpage shows:

```
$ man 3 readdir
opendir(3)                                                    opendir(3)

NAME

opendir, readdir, readdir_r, telldir, seekdir, rewinddir, closedir -
Performs operations on directories

LIBRARY

Standard C Library (libc.a)

SYNOPSIS

#include <sys/types.h>
#include <dirent.h>

DIR *opendir (
  const char *dir_name );

struct dirent *readdir (
  DIR *dir_pointer );

int readdir_r (
  DIR *dir_pointer,
  struct dirent *entry,
  struct dirent **result);

long telldir (
  DIR *dir_pointer );
```



```
void seekdir (
  DIR *dir_pointer,
  long location );

void rewinddir (
  DIR *dir_pointer );

int closedir (
  DIR *dir_pointer );

[more] (11%)
```

Reading through the manpage, we find that getting data from a directory is similar to getting data from a file.

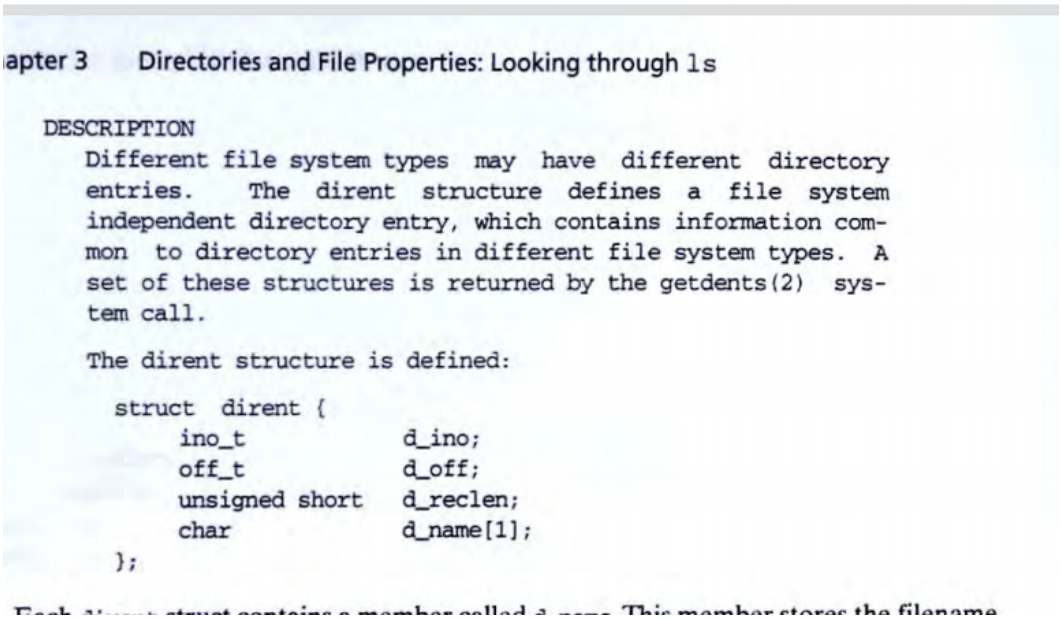
`opendir` opens a connection to a directory, `readdir` returns a pointer to the next item in the directory, and `closedir` shuts down the connection.

The following is the manpage of `dirent.h`:

File Formats dirent(4)

NAME
dirent - file system independent directory entry

SYNOPSIS
#include <dirent.h>



apter 3 Directories and File Properties: Looking through ls

DESCRIPTION
Different file system types may have different directory entries. The dirent structure defines a file system independent directory entry, which contains information common to directory entries in different file system types. A set of these structures is returned by the getdents(2) system call.

The dirent structure is defined:

```
struct dirent {
    ino_t          d_ino;
    off_t          d_off;
    unsigned short d_reclen;
    char           d_name[1];
};
```

3.5 Can I write ls?

We write the first version of `ls1.c`. The code is in the `code` folder under the same file repository

3.5.1 How did we do?

Our version 1.0 ls needs work in the following areas:

1. Not sorted

   Our list of filenames is not sorted alphabetically.

   Fix: We could read all the filenames into an array and then use qsort to sort the array.

2. No Columns

   Standard `ls` arranges the list of files in columns.

Fix: Read the list of names into an array and then figure out column widths and heights.

3. List '.' files

   This version displays the names of dot files. The standard version of `ls` only shows these if the `-a` option is specified.

   Fix: It should be easy to suppress these names and add the -a option.

4. No `-l` info

   The standard ls displays information about a file if the user specified the `-l` option, ours doesn't.