Homework Assignment #4: Searching a file

Outline

- opendir( )
- readdir()
- closedir()
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opendir( )

```
#include <dirent.h>
```

```
DIR *opendir(const char *name);
```

EX: DIR* pDir = opendir(“.”);

- **DESCRIPTION**
  - Opens a directory stream corresponding to the directory *name*, and returns a pointer to the directory stream. The stream is positioned at the first entry in the directory.

- **RETURN VALUE**
  - Return a pointer to the directory stream. On error, NULL is returned

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readdir()

```
#include <dirent.h>
```

```
struct dirent *readdir(DIR *dirp);
```

EX:

```
struct dirent* pEntry = NULL;
while ((pEntry = readdir(pDir)) != NULL) {  …  }
```

- **DESCRIPTION**
  - Returns a pointer to a *dirent* structure representing the next directory entry in the directory stream pointed to by *dirp*.
- **RETURN VALUE**
  - On success, **readdir**() returns a pointer to a *dirent* structure.
  - If the end of the directory stream is reached or error, NULL is returned

dirent structure

```
struct dirent {

ino_t d_ino;                    /* Inode number */
off_t d_off;                    /* current position in the directory
                                   stream.*/

unsigned short d_reclen;        /* Length of this record */
unsigned char d_type;           /* Type of file; not supported by
                                   all filesystem types */

char d_name[256];               /* Null-terminated filename */


};
```

dirent structure (cont.)

- The following macro *constants* for the value returned in ***d_type***:
  - **DT_BLK** This is a block device.
  - **DT_CHR** This is a character device.
  - **DT_DIR** This is a directory.
  - **DT_FIFO** This is a named pipe (FIFO).
  - **DT_LNK** This is a symbolic link.
  - **DT_REG** This is a regular file.
  - **DT_SOCK** This is a UNIX domain socket.
  - **DT_UNKNOWN** The file type could not be determined.

- Only Btrfs, ext2, ext3, and ext4 have full support for returning the file type in *d_type*.

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closedir()

```
#include <dirent.h>
```

```
int closedir(DIR *dirp);
```

EX: closedir(pDir);

- **DESCRIPTION**
  - Closes the directory stream associated with *dirp*. A successful call to **closedir**() also closes the underlying file descriptor associated with *dirp*.
- **RETURN VALUE**
  - Returns 0 on success. On error, -1 is returned

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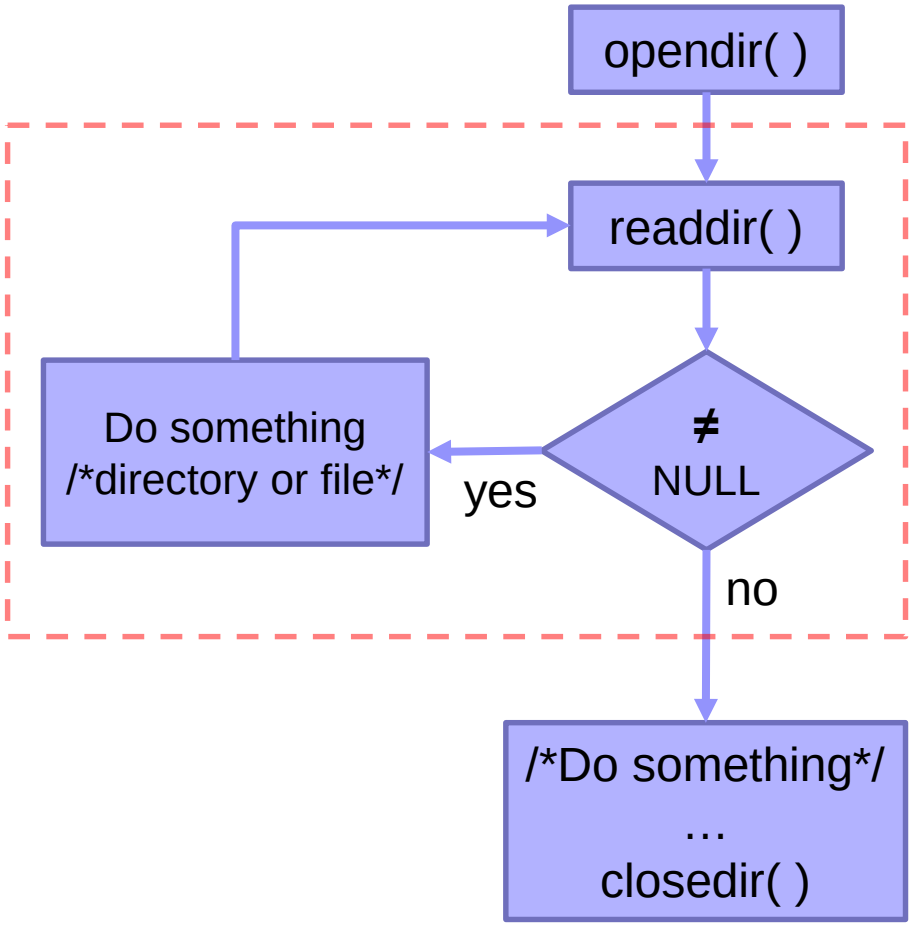
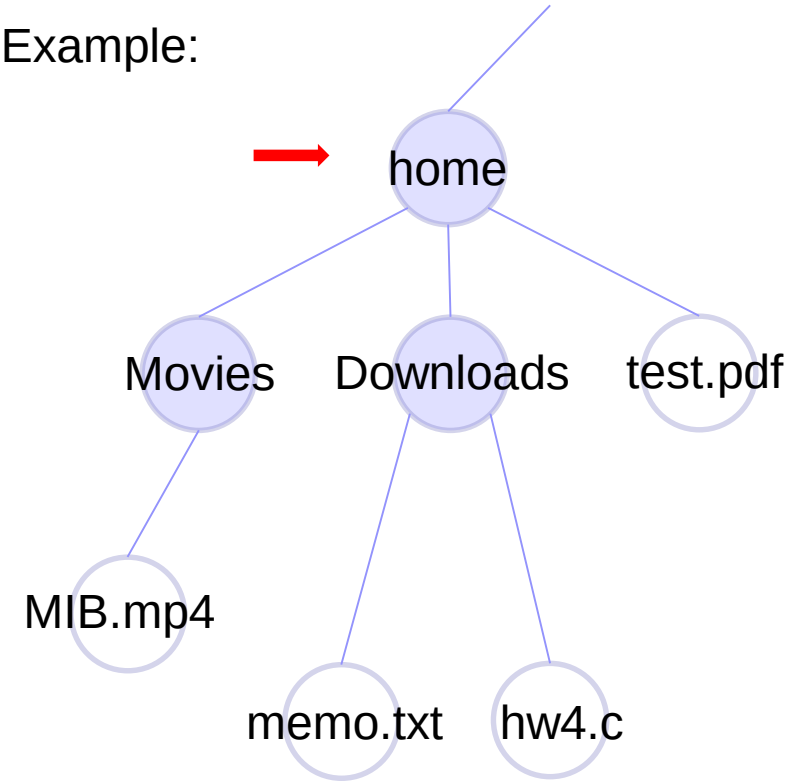
- **Searching a file**

- Write a program that takes a *file name* and a *directory name*.
- Start at a given directory and descends the file tree from that point to search the file with the given file name.
- If the user does not give the starting directory parameter, assume that the starting directory is the current directory.
- If found, please print the corresponding pathname of the file.
- Otherwise, please show a “cannot find the corresponding file” message.

Flowchart



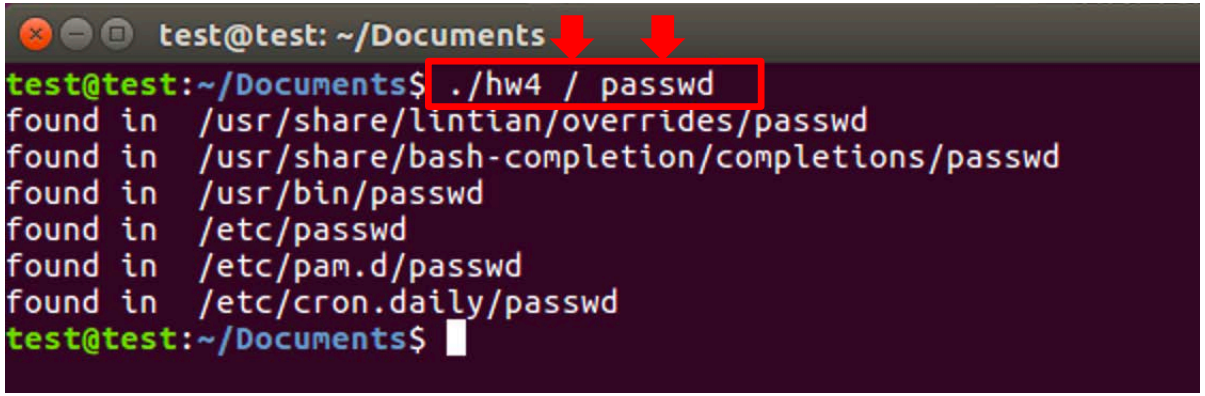
Example:



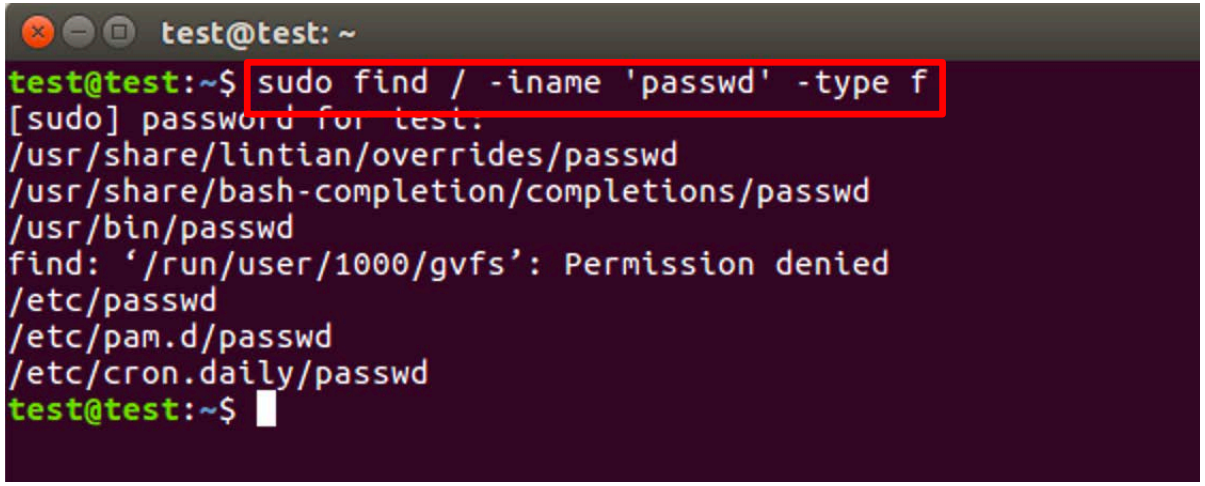
Note : readdir() will return ‘ . ’ and ‘ .. ’, so skip them to avoid the loop.

Homework Assignment #4

- Ex1: Searching *'passwd'* at root directory



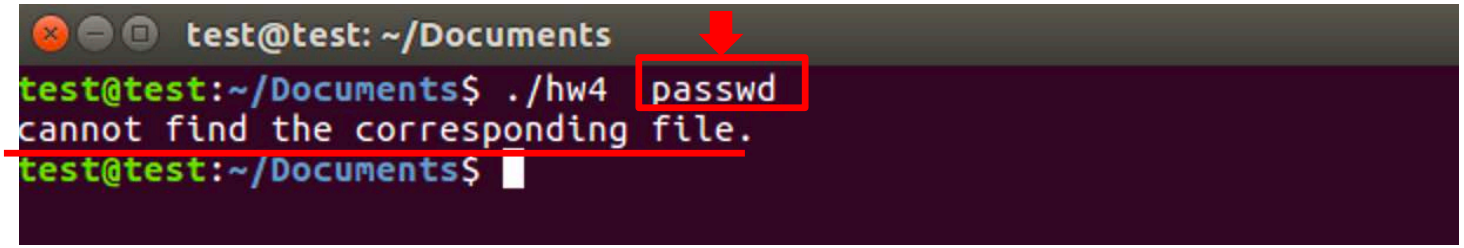
Your Program

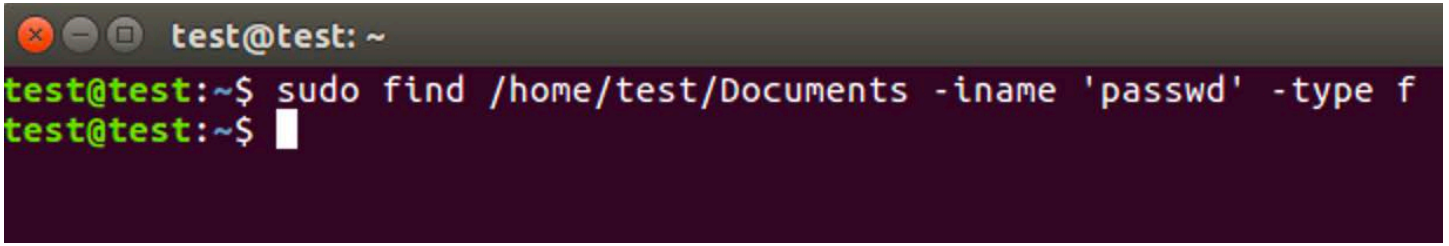


For Checking

Homework Assignment #4

- Ex2: Searching '*passwd*' at default directory (current directory)





Note

- Please use Linux platform.
- Make sure that all necessary header file be included.
- Leave an appropriate comment.

Turn in

- Deadline

  2020/05/27 23:59:59

- Upload to i-learning

- File name
  - Source code (e.g. HW4_7105056035.c)
  - Word file (e.g. HW4_7105056035.docx)

- If you don’t hand in your homework on time, your score will be deducted 10 points every day.

TA

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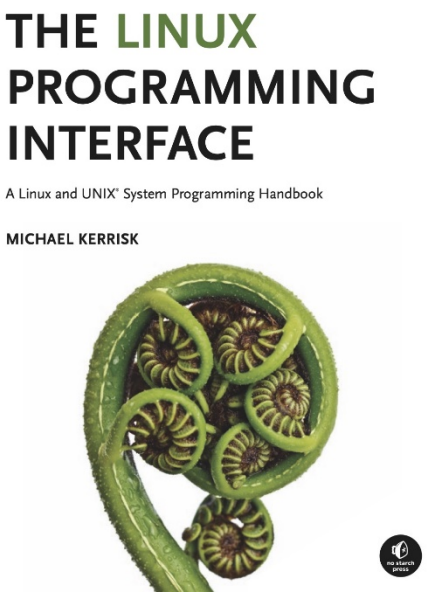
- Title format: File System HW# - [your name]
- Lab: OSNET(1001A)

Reference

- Websites:
  - http://man7.org/linux/man-pages/man3/opendir.3.html
  - http://man7.org/linux/man-pages/man3/readdir.3.html
  - http://man7.org/linux/man-pages/man3/closedir.3.html

- Book:
  - The Linux Programming Interface - A Linux and UNIX System Programming Handbook



ANY QUESTION?