# LAB_02_OS_Assignment

# CE-054

**Aim: Implementation of “pwd” and “ls” commands. (Use of getcwd, opendir, closedir, readdir functions)**

## (1) opendir:

The opendir() function opens a directory stream corresponding to the directory name, and returns a pointer to the directory stream.

**Syntax:**

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

#include <dirent.h>

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

The stream is positioned at the first entry in the directory.

On error, NULL is returned, and errno is set appropriately.

## (2) closedir:

The closedir() function closes the directory stream associated with dirp. The directory stream descriptor dirp is not available after this call.

**Syntax:**

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

#include <dirent.h>
int closedir(DIR *dirp);
```

The closedir() function returns 0 on success.

On error, -1 is returned, and errno is set appropriately.

**(3) readdir:**

The readdir() function returns a pointer to a dirent structure representing the next directory entry in the directory stream pointed to by dirp.

**Syntax :**

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

*readdir(DIR *dirp);
```

It returns NULL on reaching the end of the directory stream.

On success, readdir() returns a pointer to a dirent structure.

On Linux, the dirent structure is defined as follows:

```
struct dirent {
    ino_t          d_ino;             /* inode number */

    off_t          d_off;             /* offset to the next dirent */

    unsigned short d_reclen;          /* length of this record */

    unsigned char  d_type;            /* type of file*/

    char           d_name[256];       /* filename */
};
```

If the end of the directory stream is reached, NULL is returned and errno is not changed.  If an error occurs, NULL is returned and errno is set appropriately.

**(4) getcwd and current dir name:**

This function returns the absolute pathname that is the current working directory of the calling process.

**Syntax** :

```
#include <unistd.h>  char
*getcwd(char *buf, size_t size);
char *get_current_dir_name(void);
```

Pathname is returned as the function result and via the argument buf, if present.

**(5) getwd:**

The getwd() function shall determine an absolute pathname of the current working directory of the calling process, and copy a string containing that pathname into the array pointed to by the path_name argument.

**Syntax :**

```
char *getwd(char *buf);
```

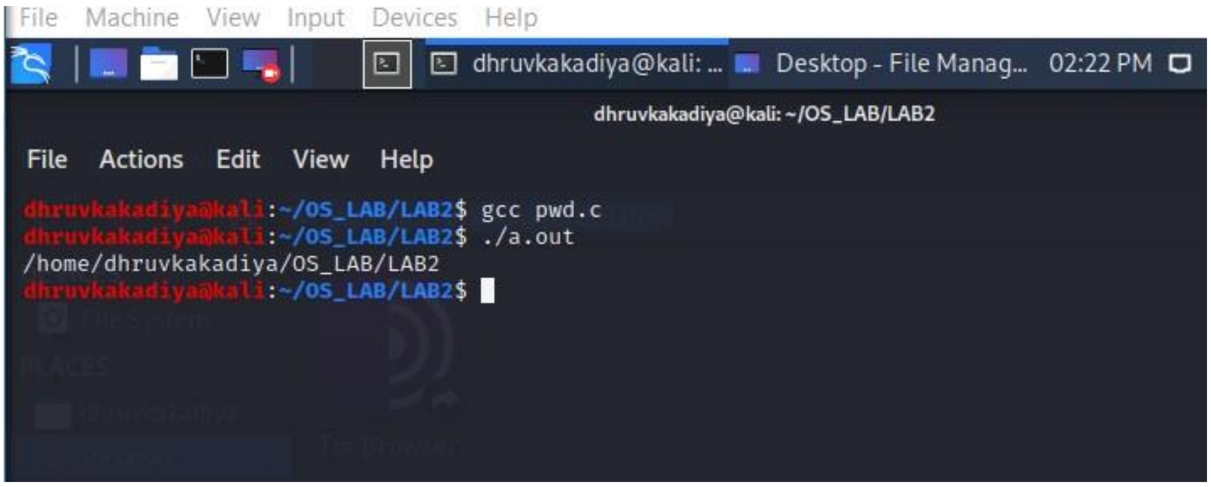
- Assignments:
  1. Implementation of pwd cmd.

  Code:

```
#include<unistd.h>
#include<stdio.h>

void main()
{
```

```
            char buf[1024];

getcwd(buf, sizeof(buf));

printf("%s",buf);

printf("\n");

}
```

**Output :**



File Machine View Input Devices Help
dhruvkakadiya@kali: ...
Desktop - File Manag...
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dhruvkakadiya@kali: ~/OS_LAB/LAB2
File Actions Edit View Help

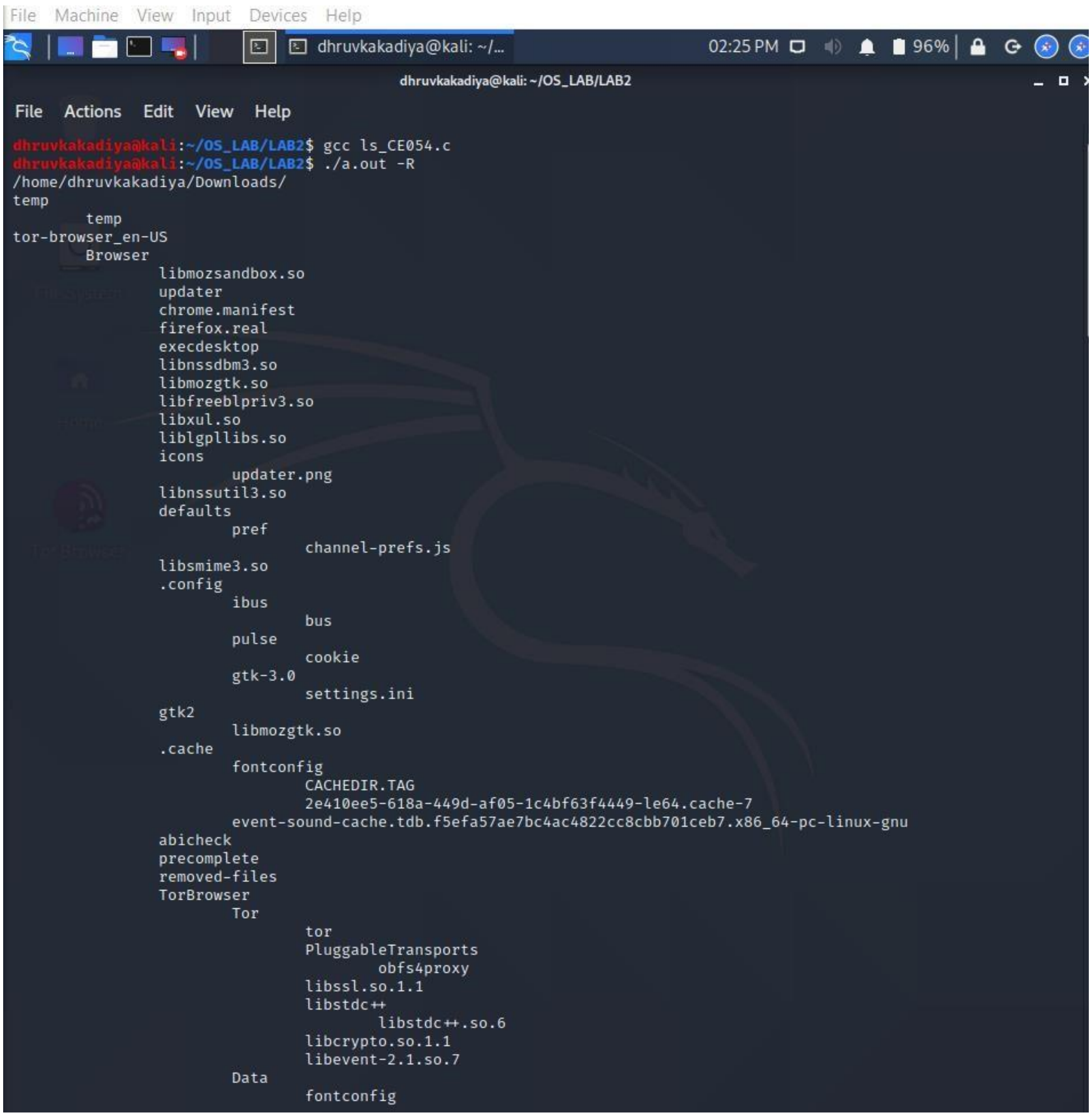
```
dhruvkakadiya@kali:~/OS_LAB/LAB2$ gcc pwd.c
dhruvkakadiya@kali:~/OS_LAB/LAB2$ ./a.out
/home/dhruvkakadiya/OS_LAB/LAB2
dhruvkakadiya@kali:~/OS_LAB/LAB2$
```

2. Implementation of ls cmd. Code:

```
#include<unistd.h>
#include<dirent.h>
#include<stdio.h>
#include<sys/types.h>
#include<string.h> #include<stdlib.h>
void recursion(char path[], char name[], int mode); void
recursion(char path[], char name[], int mode)
{
    struct dirent *dirp;         DIR
*dir;           char path_in[1000];
    strcpy(path_in, path);
    strcat(path_in, "/");
    strcat(path_in, name);    if((dir
= opendir(path_in)) == 0)    {
            printf("Error");
            exit(0);
    }
    while(dirp = readdir(dir))
    {
            if(strcmp(dirp->d_name, ".") != 0 && strcmp(dirp->d_name, "..") != 0)
            {
                    for(int i=0 ; i < mode ; i++)
```

```
                {
                        printf(" ");
                }
                printf("%s\n", dirp->d_name);
                if(dirp->d_type == DT_DIR)
                {
                        mode += 1;
                        recurse(path_in, dirp->d_name, mode);
                        mode -= 1;
                }
        }
    }
    closedir(dir);
    return;
}

int main() {
    struct dirent
*dirp;      DIR *dir;
    char path[1000];
    scanf("%s", path);
    if((dir = opendir(path)) == 0)
    {
        printf("Error: open dir");
        exit(0);
    }
    while(dirp = readdir(dir))
    {
        if(strcmp(dirp->d_name, ".") != 0 && strcmp(dirp->d_name, "..") != 0)
        {
                printf("%s\n", dirp->d_name);
                if(dirp->d_type == DT_DIR)
                {
                        recursion(path, dirp->d_name, 1);
                }
        }
    }
    closedir(dir);}
```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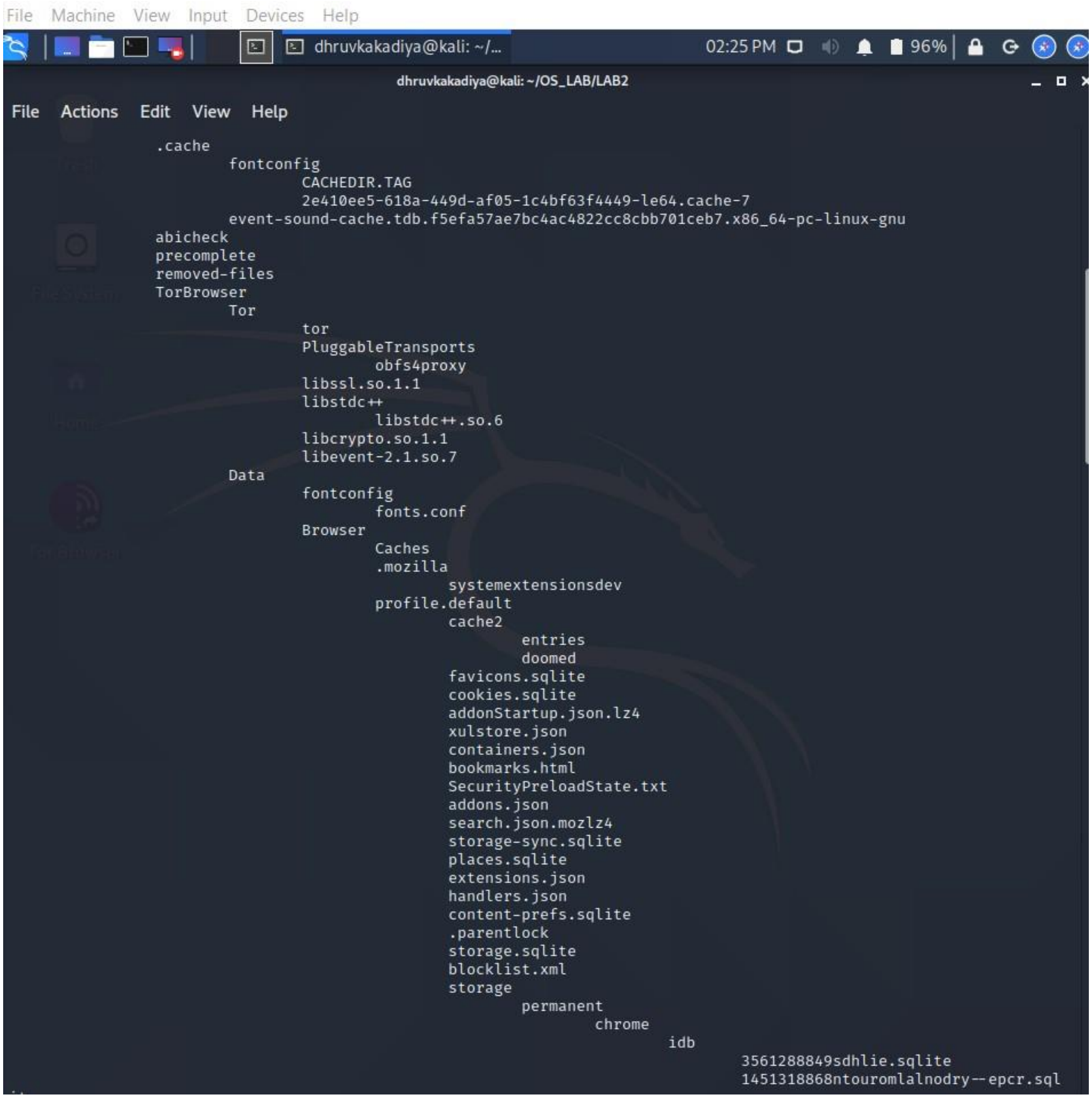
```
dhruvkakadiya@kali:~/OS_LAB/LAB2$ gcc ls_CE054.c
dhruvkakadiya@kali:~/OS_LAB/LAB2$ ./a.out -R
/home/dhruvkakadiya/Downloads/
temp
        temp
tor-browser_en-US
        Browser
                libmozsandbox.so
                updater
                chrome.manifest
                firefox.real
                execdesktop
                libnssdbm3.so
                libmozgtk.so
                libfreeblpriv3.so
                libxul.so
                liblgpllibs.so
                icons
                        updater.png
                libnssutil3.so
                defaults
                        pref
                                channel-prefs.js
                libsmime3.so
                .config
                        ibus
                                bus
                        pulse
                                cookie
                        gtk-3.0
                                settings.ini
                gtk2
                        libmozgtk.so
                .cache
                        fontconfig
                                CACHEDIR.TAG
                                2e410ee5-618a-449d-af05-1c4bf63f4449-le64.cache-7
                        event-sound-cache.tdb.f5efa57ae7bc4ac4822cc8cbb701ceb7.x86_64-pc-linux-gnu
                abicheck
                precomplete
                removed-files
                TorBrowser
                        Tor
                                tor
                                PluggableTransports
                                        obfs4proxy
                                libssl.so.1.1
                                libstdc++
                                        libstdc++.so.6
                                libcrypto.so.1.1
                                libevent-2.1.so.7
                        Data
                                fontconfig
```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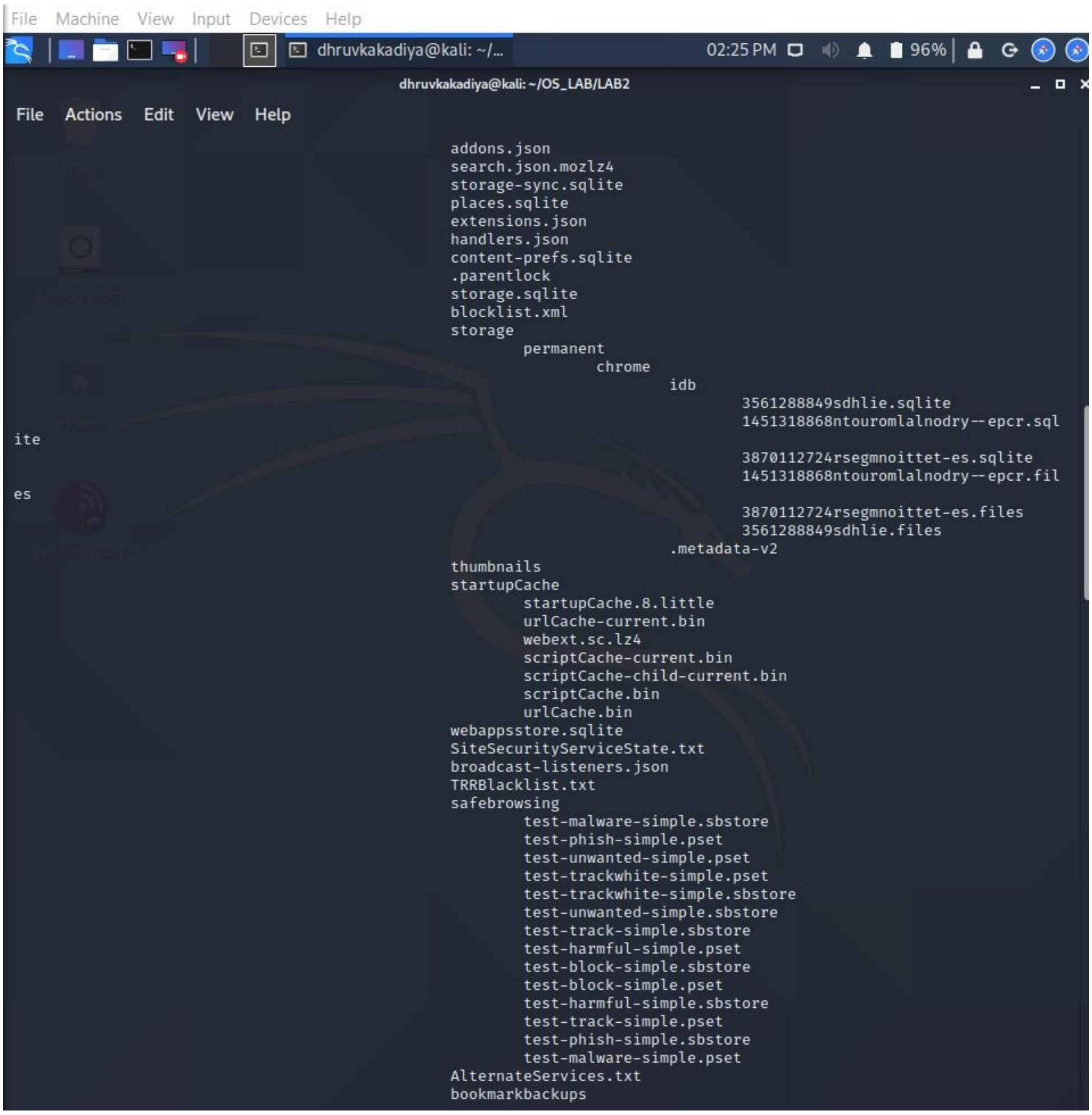
```
        .cache
                fontconfig
                        CACHEDIR.TAG
                        2e410ee5-618a-449d-af05-1c4bf63f4449-le64.cache-7
                event-sound-cache.tdb.f5efa57ae7bc4ac4822cc8cbb701ceb7.x86_64-pc-linux-gnu
        abicheck
        precomplete
        removed-files
        TorBrowser
                Tor
                        tor
                        PluggableTransports
                                obfs4proxy
                        libssl.so.1.1
                        libstdc++
                                libstdc++.so.6
                        libcrypto.so.1.1
                        libevent-2.1.so.7
                Data
                        fontconfig
                                fonts.conf
                        Browser
                                Caches
                                .mozilla
                                        systemextensionsdev
                                profile.default
                                        cache2
                                                entries
                                                doomed
                                        favicons.sqlite
                                        cookies.sqlite
                                        addonStartup.json.lz4
                                        xulstore.json
                                        containers.json
                                        bookmarks.html
                                        SecurityPreloadState.txt
                                        addons.json
                                        search.json.mozlz4
                                        storage-sync.sqlite
                                        places.sqlite
                                        extensions.json
                                        handlers.json
                                        content-prefs.sqlite
                                        .parentlock
                                        storage.sqlite
                                        blocklist.xml
                                        storage
                                                permanent
                                                        chrome
                                                                idb
                                                                        3561288849sdhlie.sqlite
                                                                        1451318868ntouromlalnodry--epcr.sql
```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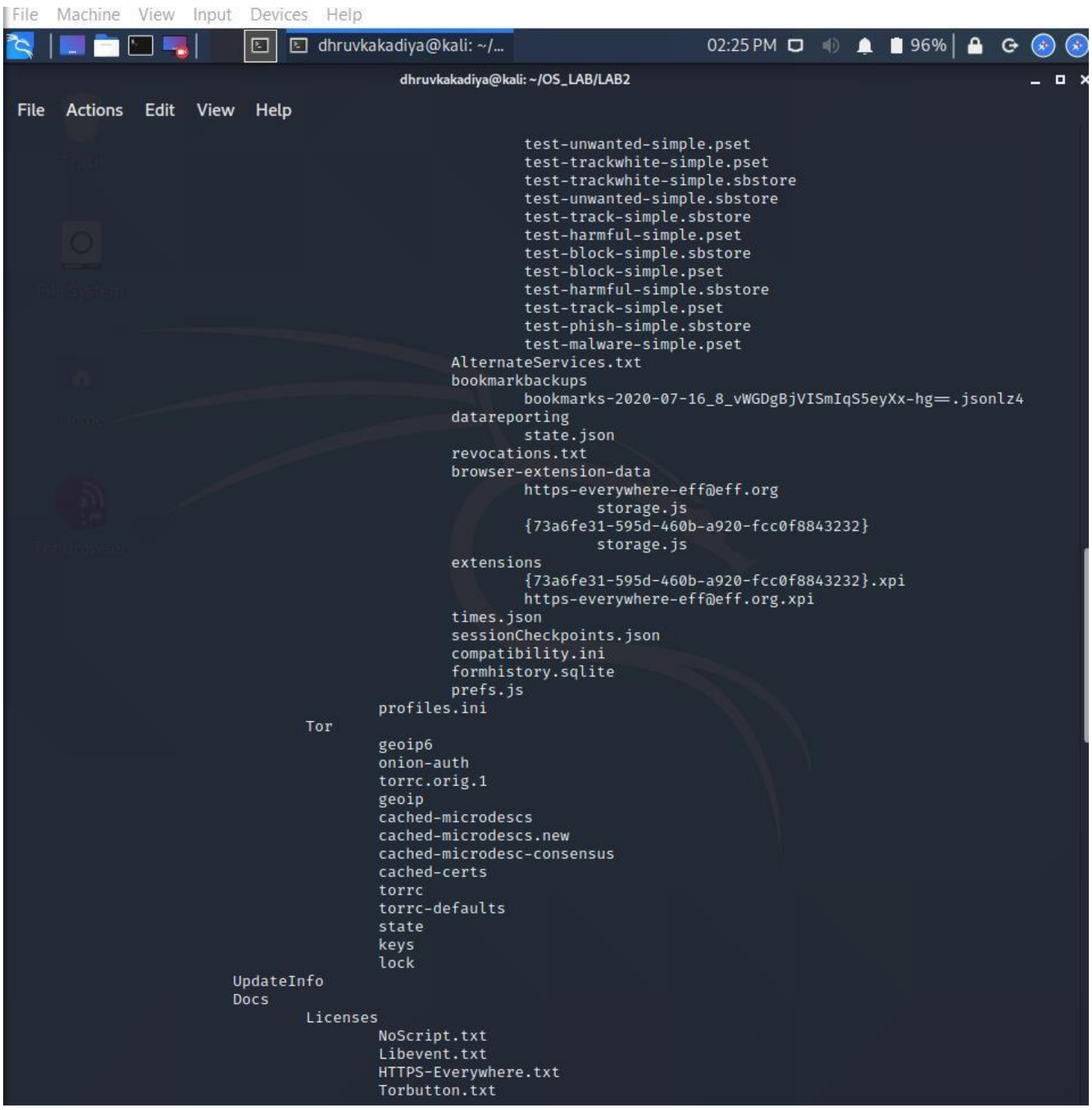
```
                                        addons.json
                                        search.json.mozlz4
                                        storage-sync.sqlite
                                        places.sqlite
                                        extensions.json
                                        handlers.json
                                        content-prefs.sqlite
                                        .parentlock
                                        storage.sqlite
                                        blocklist.xml
                                        storage
                                                permanent
                                                        chrome
                                                                idb
                                                                        3561288849sdhlie.sqlite
                                                                        1451318868ntouromlalnodry--epcr.sql
ite
                                                                        3870112724rsegmnoittet-es.sqlite
                                                                        1451318868ntouromlalnodry--epcr.fil
es
                                                                        3870112724rsegmnoittet-es.files
                                                                        3561288849sdhlie.files
                                                                .metadata-v2
                                        thumbnails
                                        startupCache
                                                startupCache.8.little
                                                urlCache-current.bin
                                                webext.sc.lz4
                                                scriptCache-current.bin
                                                scriptCache-child-current.bin
                                                scriptCache.bin
                                                urlCache.bin
                                        webappsstore.sqlite
                                        SiteSecurityServiceState.txt
                                        broadcast-listeners.json
                                        TRRBlacklist.txt
                                        safebrowsing
                                                test-malware-simple.sbstore
                                                test-phish-simple.pset
                                                test-unwanted-simple.pset
                                                test-trackwhite-simple.pset
                                                test-trackwhite-simple.sbstore
                                                test-unwanted-simple.sbstore
                                                test-track-simple.sbstore
                                                test-harmful-simple.pset
                                                test-block-simple.sbstore
                                                test-block-simple.pset
                                                test-harmful-simple.sbstore
                                                test-track-simple.pset
                                                test-phish-simple.sbstore
                                                test-malware-simple.pset
                                        AlternateServices.txt
                                        bookmarkbackups
```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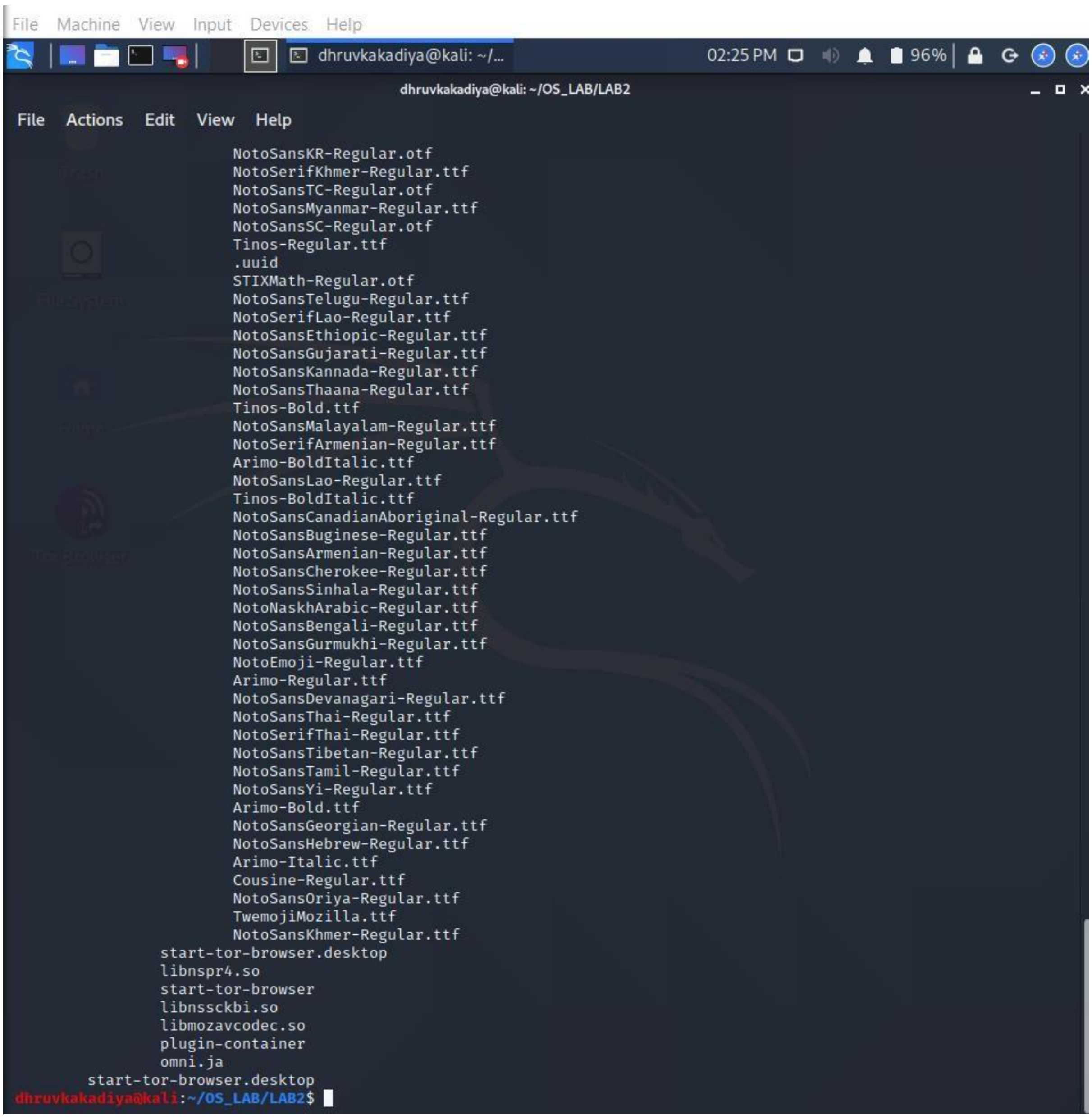
```
                                        test-unwanted-simple.pset
                                        test-trackwhite-simple.pset
                                        test-trackwhite-simple.sbstore
                                        test-unwanted-simple.sbstore
                                        test-track-simple.sbstore
                                        test-harmful-simple.pset
                                        test-block-simple.sbstore
                                        test-block-simple.pset
                                        test-harmful-simple.sbstore
                                        test-track-simple.pset
                                        test-phish-simple.sbstore
                                        test-malware-simple.pset
                                AlternateServices.txt
                                bookmarkbackups
                                        bookmarks-2020-07-16_8_vWGDgBjVISmIqS5eyXx-hg==.jsonlz4
                                datareporting
                                        state.json
                                revocations.txt
                                browser-extension-data
                                        https-everywhere-eff@eff.org
                                                storage.js
                                        {73a6fe31-595d-460b-a920-fcc0f8843232}
                                                storage.js
                                extensions
                                        {73a6fe31-595d-460b-a920-fcc0f8843232}.xpi
                                        https-everywhere-eff@eff.org.xpi
                                times.json
                                sessionCheckpoints.json
                                compatibility.ini
                                formhistory.sqlite
                                prefs.js
                        profiles.ini
                Tor
                        geoip6
                        onion-auth
                        torrc.orig.1
                        geoip
                        cached-microdescs
                        cached-microdescs.new
                        cached-microdesc-consensus
                        cached-certs
                        torrc
                        torrc-defaults
                        state
                        keys
                        lock
        UpdateInfo
        Docs
                Licenses
                        NoScript.txt
                        Libevent.txt
                        HTTPS-Everywhere.txt
                        Torbutton.txt
```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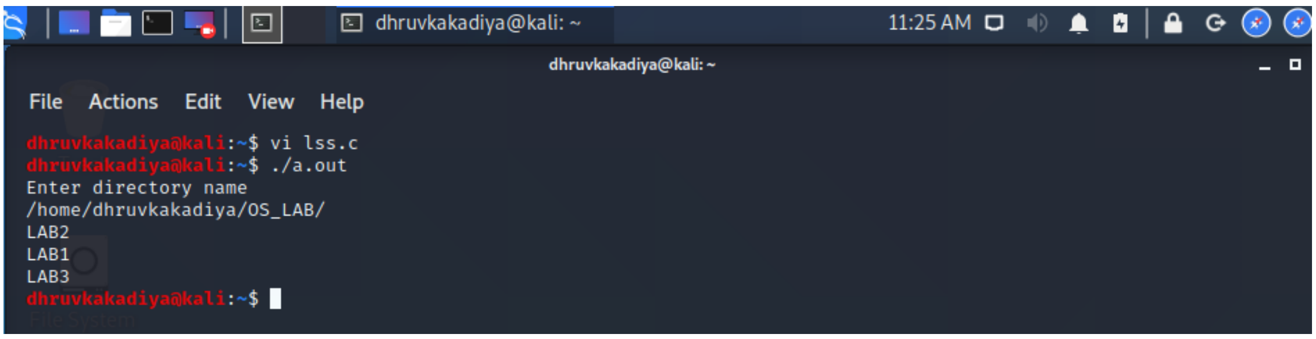
dhruvkakadiya@kali: ~/OS_LAB/LAB2
File Actions Edit View Help

```
                    NotoSansKR-Regular.otf
                    NotoSerifKhmer-Regular.ttf
                    NotoSansTC-Regular.otf
                    NotoSansMyanmar-Regular.ttf
                    NotoSansSC-Regular.otf
                    Tinos-Regular.ttf
                    .uuid
                    STIXMath-Regular.otf
                    NotoSansTelugu-Regular.ttf
                    NotoSerifLao-Regular.ttf
                    NotoSansEthiopic-Regular.ttf
                    NotoSansGujarati-Regular.ttf
                    NotoSansKannada-Regular.ttf
                    NotoSansThaana-Regular.ttf
                    Tinos-Bold.ttf
                    NotoSansMalayalam-Regular.ttf
                    NotoSerifArmenian-Regular.ttf
                    Arimo-BoldItalic.ttf
                    NotoSansLao-Regular.ttf
                    Tinos-BoldItalic.ttf
                    NotoSansCanadianAboriginal-Regular.ttf
                    NotoSansBuginese-Regular.ttf
                    NotoSansArmenian-Regular.ttf
                    NotoSansCherokee-Regular.ttf
                    NotoSansSinhala-Regular.ttf
                    NotoNaskhArabic-Regular.ttf
                    NotoSansBengali-Regular.ttf
                    NotoSansGurmukhi-Regular.ttf
                    NotoEmoji-Regular.ttf
                    Arimo-Regular.ttf
                    NotoSansDevanagari-Regular.ttf
                    NotoSansThai-Regular.ttf
                    NotoSerifThai-Regular.ttf
                    NotoSansTibetan-Regular.ttf
                    NotoSansTamil-Regular.ttf
                    NotoSansYi-Regular.ttf
                    Arimo-Bold.ttf
                    NotoSansGeorgian-Regular.ttf
                    NotoSansHebrew-Regular.ttf
                    Arimo-Italic.ttf
                    Cousine-Regular.ttf
                    NotoSansOriya-Regular.ttf
                    TwemojiMozilla.ttf
                    NotoSansKhmer-Regular.ttf
            start-tor-browser.desktop
            libnspr4.so
            start-tor-browser
            libnssckbi.so
            libmozavcodec.so
            plugin-container
            omni.ja
        start-tor-browser.desktop
dhruvkakadiya@kali:~/OS_LAB/LAB2$
```

3. Implementation of simple ls cmd.

```
#include<stdio.h>
#include<dirent.h>
int main()
{
        char dirname[10];
        DIR*p;
        struct dirent *d;
        printf("Enter directory name\n");
        scanf("%s",dirname);
        p = opendir(dirname);
        if(p==NULL)
        {
                perror("Cannot find directory");
                exit(1);
        }
        while(d=readdir(p))
        {
                if (strcmp(d->d_name, “.”) != 0 && strcmp(d->d_name, “..”) != 0)
                        printf("%s\n",d->d_name);
}
```



```
dhruvkakadiya@kali:~$ vi lss.c
dhruvkakadiya@kali:~$ ./a.out
Enter directory name
/home/dhruvkakadiya/OS_LAB/
LAB2
LAB1
LAB3
dhruvkakadiya@kali:~$
```