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);
```

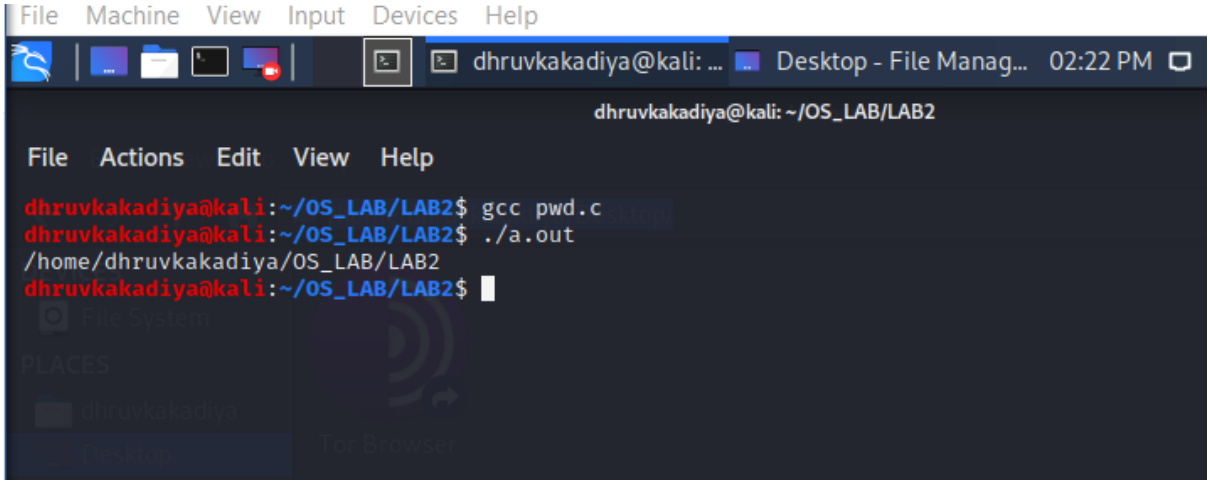
- Assignments:
  1. Implementation of pwd cmd.

  Code:

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

```
void main()
{
        char buf[1024];
        getcwd(buf, sizeof(buf));
        printf("%s",buf);
        printf("\n");
}
```

Output :

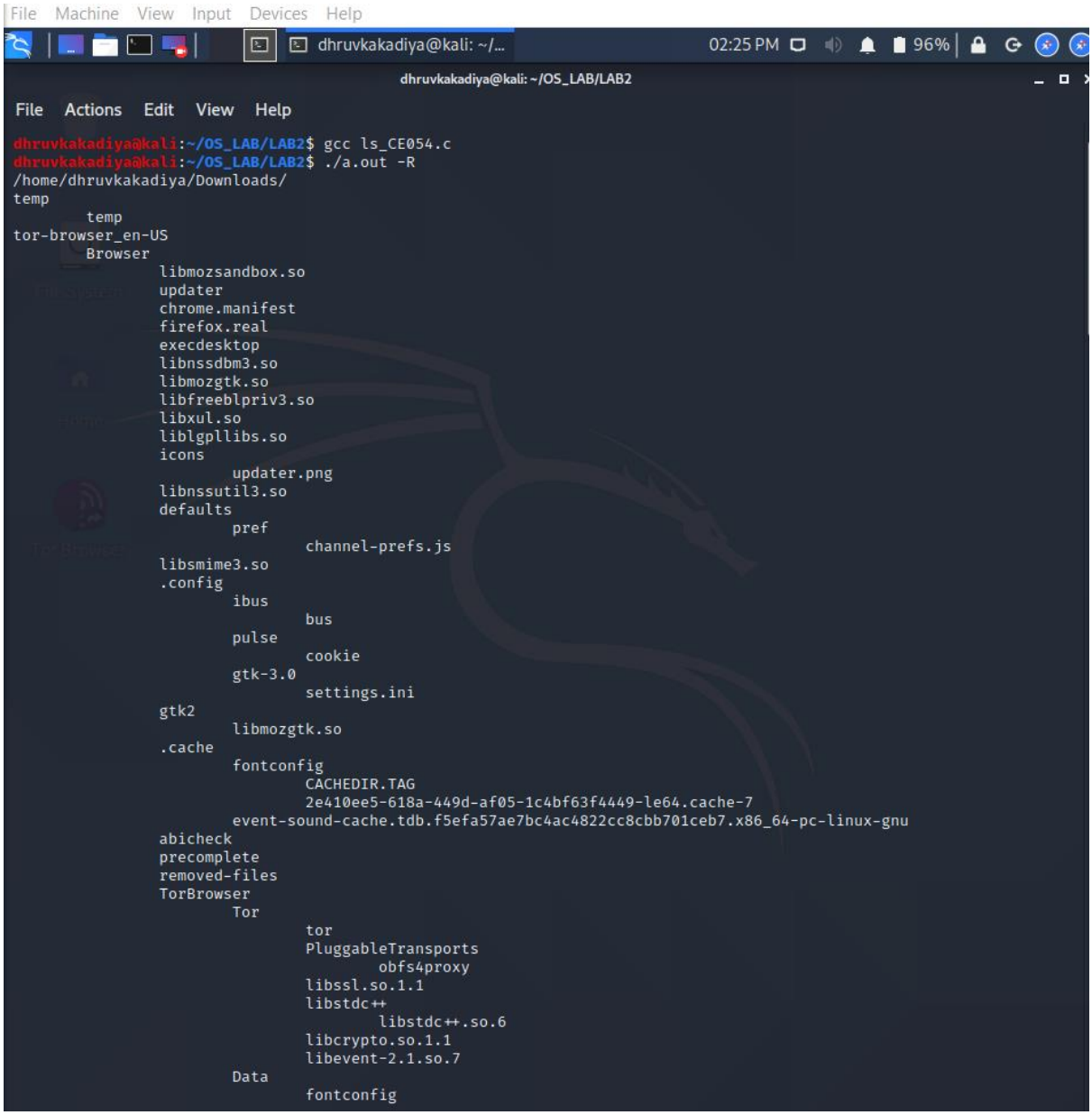


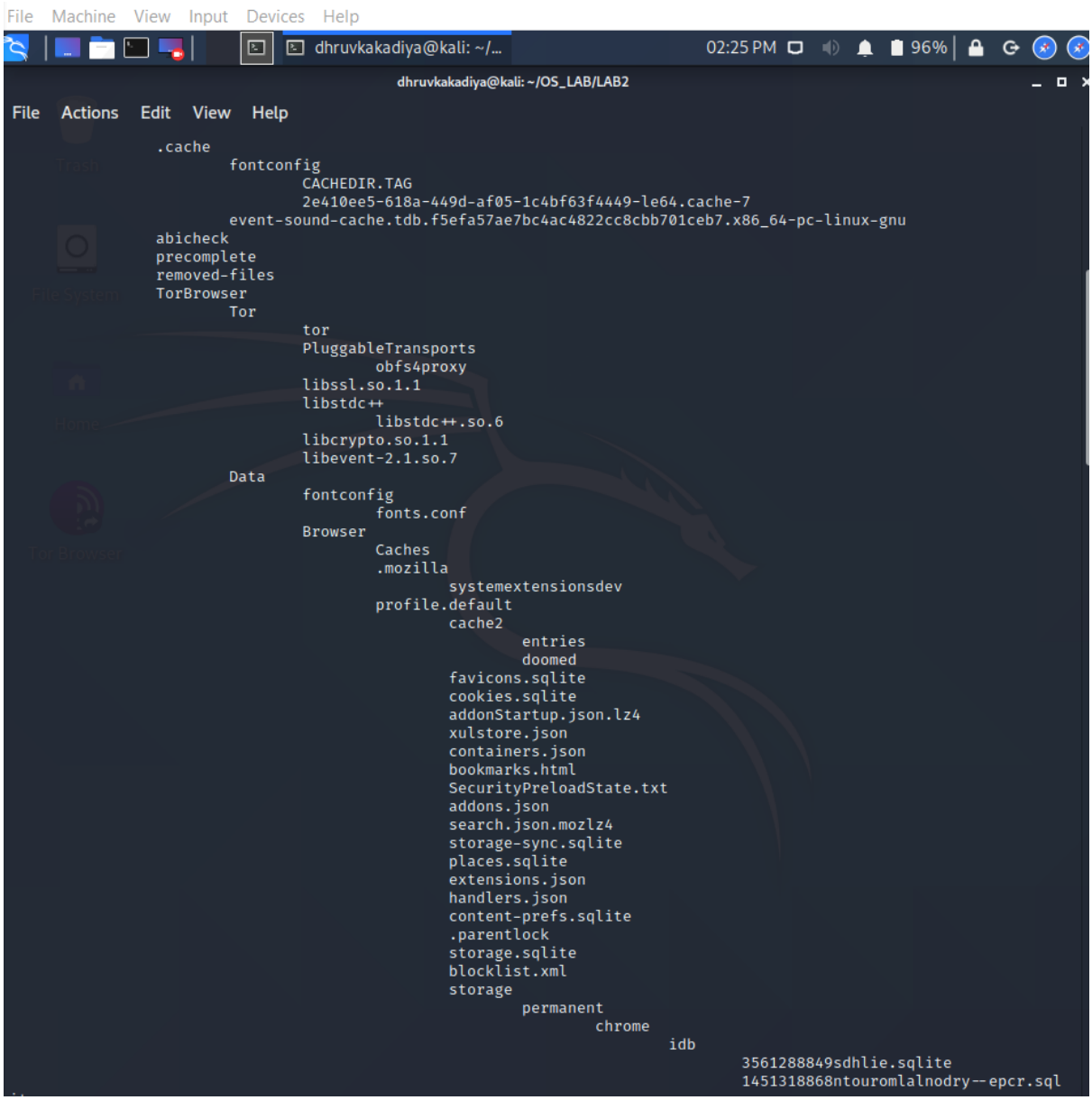
2. Implementation of ls cmd.

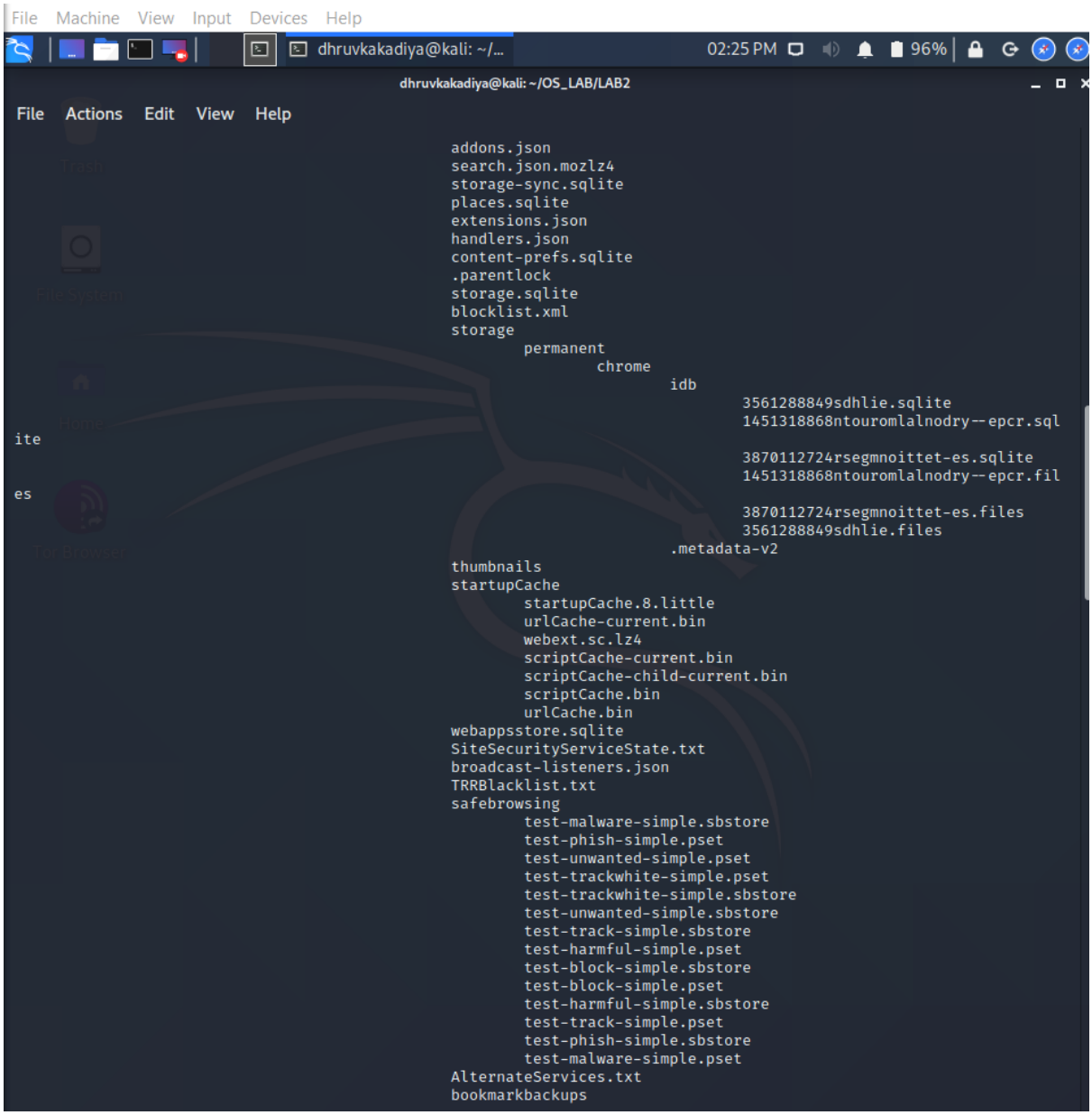
Code:

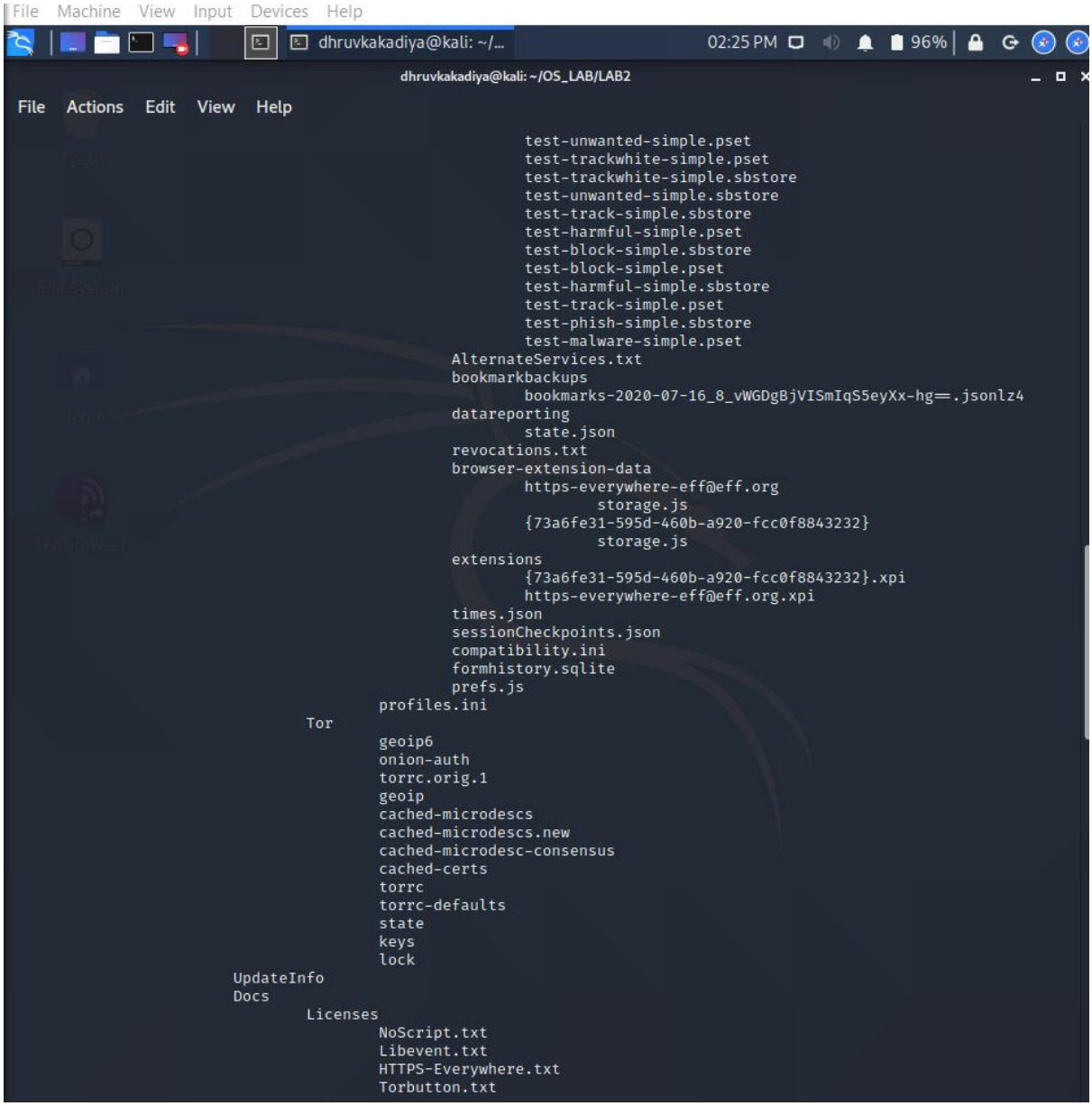
```
#include<unistd.h>
#include<dirent.h>
#include<stdio.h>
#include<sys/types.h>
#include<string.h>
#include<stdlib.h>
void recursion(char path[], char name[], int mode);
void recursion(char path[], char name[], int mode)
{
    struct dirent *dirp;
    DIR *dir;
    char path_in[1000];
    strcpy(path_in, path);
    strcat(path_in, "/");
    strcat(path_in, name);
    if((dir = opendir(path_in)) == 0)
```

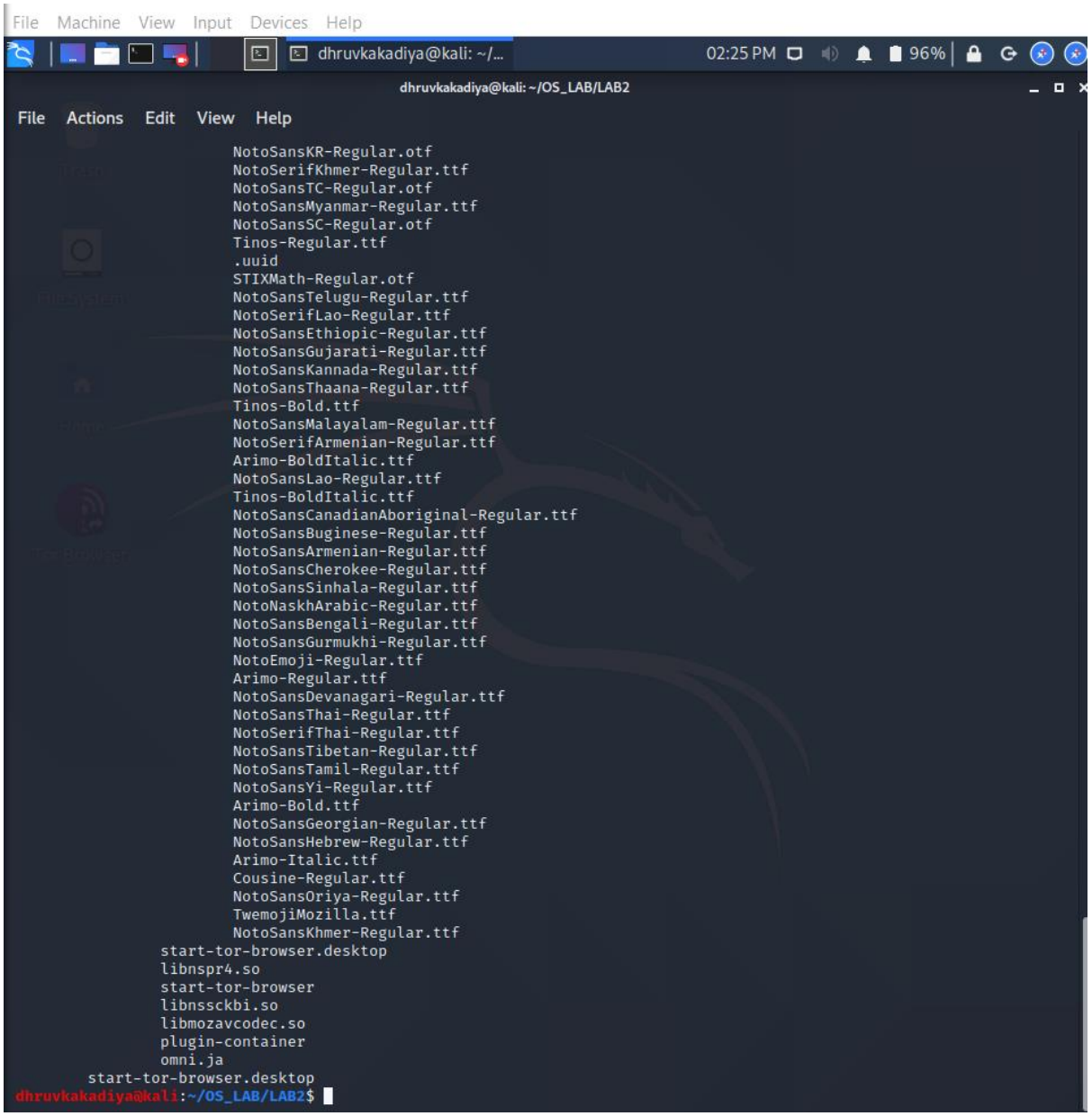
```
	{
		printf("Error");
		exit(0);
	}
	while(dirp = readdir(dir))
	{
		if(strcmp(dirp->d_name, ".") != 0 && strcmp(dirp->d_name, "..") != 0)
		{
			for(int i=0 ; i < mode ; i++)
			{
				printf("  ");
			}
			printf("%s\n", dirp->d_name);
			if(dirp->d_type == DT_DIR)
			{
				mode += 1;
				recurse(path_in, 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);}
```


File Machine View Input Devices Help
dhruvkakadiya@kali: ~/...
02:25 PM
96%
dhruvkakadiya@kali: ~/OS_LAB/LAB2
File Actions Edit View Help
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


File Machine View Input Devices Help
dhruvkakadiya@kali: ~/...
02:25 PM
96%
dhruvkakadiya@kali: ~/OS_LAB/LAB2
File Actions Edit View Help
.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


File Machine View Input Devices Help
dhruvkakadiya@kali: ~/...
02:25 PM
96%
dhruvkakadiya@kali: ~/OS_LAB/LAB2
File Actions Edit View Help
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


File Machine View Input Devices Help
dhruvkakadiya@kali: ~/...
02:25 PM
96%
dhruvkakadiya@kali: ~/OS_LAB/LAB2
File Actions Edit View Help
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


File Machine View Input Devices Help
dhruvkakadiya@kali: ~/...
02:25 PM
96%
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$