

-: OS-LAB-2 :-

EXCERCISE :

1. Write a C program to emulate the ls -l UNIX command that prints all files in a current directory and lists access privileges, etc. DO NOT simply exec ls -l from the program.

pgm1.c

```
#include <stdio.h>
#include <stdlib.h>
#include <sys/stat.h>
#include <sys/types.h>
#include <unistd.h>
#include <fcntl.h>
#include <string.h>
#include <dirent.h>
int main()
{
    DIR *directory1 =
    opendir("/home/Student/190905514/FIFTH-SEM/OS-LAB/LAB2");
    char *buffer;
    DIR *directory2;
    if (directory1 == NULL)
    {
        printf("Directory not accessible:\n");
        exit(0);
    }
    struct dirent *item;
    struct stat statusBuffer;
    while ((item = readdir(directory1)) != NULL)
    {
        lstat(item->d_name, &statusBuffer);
        if (S_ISDIR(statusBuffer.st_mode))
        {
            if (strcmp(".", item->d_name) == 0 || strcmp("../", item->d_name) == 0)
                continue;
        }
    }
}
```

```
printf("d");
}
else
printf("-");
if (statusBuffer.st_mode & S_IRUSR)
{
printf("r");
}
else
printf("-");
if (statusBuffer.st_mode & S_IWUSR)
{
printf("w");
}
else
printf("-");
if (statusBuffer.st_mode & S_IXUSR)
{
printf("x");
}
else
printf("-");
if (statusBuffer.st_mode & S_IRGRP)
{
printf("r");
}
else
printf("-");
if (statusBuffer.st_mode & S_IWGRP)
{
printf("w");
}
else
printf("-");
if (statusBuffer.st_mode & S_IXGRP)
{
printf("x");
}
else
printf("-");
```

```
if (statusBuffer.st_mode & S_IROTH)
{
printf("r");
}
else
printf("-");
if (statusBuffer.st_mode & S_IWOTH)
{
printf("w");
}
else
printf("-");
if (statusBuffer.st_mode & S_IXOTH)
{
printf("x\t");
}
else
printf("-\t");
if (S_ISDIR(statusBuffer.st_mode))
{
printf("2\t");
}
else
printf("1\t");
buffer = getlogin();
printf("%s\t", buffer);
printf("%s\n", item->d_name);
}
}
```

OUTPUT

```
Student@prg33: ~/190905514/FIFTH-SEM/OS-LAB/LAB2
File Edit View Search Terminal Help
Student@prg33:~/190905514/FIFTH-SEM/OS-LAB/LAB2$ ls
bazel.rc      index.js      pgm1          pgm2.c      saamp.png
index.html    index.tex    pgm1.c        pgm3.c      samplepgm1
index.java    input.txt    pgm1.png      pgm4.c      samplepgm1.c
Student@prg33:~/190905514/FIFTH-SEM/OS-LAB/LAB2$ gcc pgm1.c -o pgm1
Student@prg33:~/190905514/FIFTH-SEM/OS-LAB/LAB2$ ./pgm1
-rw-rw-r-- 1 Student pgm1.c
-rw-rw-r-- 1 Student input.txt
-rw-rw-r-- 1 Student pgm4.c
-rwxrwxr-x 1 Student pgm1
-rw-rw-r-- 1 Student bazel.rc
-rw-rw-r-- 1 Student index.js
-rwxrwxr-x 1 Student samplepgm1
-rw-rw-r-- 1 Student pgm3.c
-rw-rw-r-- 1 Student index.tex
-rw-rw-r-- 1 Student pgm1.png
-rw-rw-r-- 1 Student pgm2.c
-rw-rw-r-- 1 Student samplepgm1.c
-rw-rw-r-- 1 Student saamp.png
-rw-rw-r-- 1 Student index.html
-rw-rw-r-- 1 Student index.java
Student@prg33:~/190905514/FIFTH-SEM/OS-LAB/LAB2$
```

2. Write a program that will list all files in a current directory and all files in subsequent sub-directories.

pgm2.c

```
#include <unistd.h>
#include <stdio.h>
#include <dirent.h>
#include <string.h>
#include <sys/stat.h>
#include <stdlib.h>

void printDirectory(char *dir, int depth)
{
    DIR *myDirectory;
    struct dirent *myEntryToDirectory;
```

```

struct stat statusBuffer;

if ((myDirectory = opendir(dir)) == NULL)
{
    fprintf(stderr, "Directory cannot be opened: %s\n", dir);
    return;
}
chdir(dir);

while ((myEntryToDirectory = readdir(myDirectory)) != NULL)
{
    lstat(myEntryToDirectory->d_name, &statusBuffer);

    if (S_ISDIR(statusBuffer.st_mode))
    {
        if (strcmp(".", myEntryToDirectory->d_name) == 0 || strcmp("..",
myEntryToDirectory->d_name) == 0)
        {
            continue;
        }

        printf("%*s%s/\n", depth, "", myEntryToDirectory->d_name);

        printDirectory(myEntryToDirectory->d_name, depth + 4);
    }

    else
    {
        printf("%*s%s\n", depth, "", myEntryToDirectory->d_name);
    }
}
chdir("..");
closedir(myDirectory);
}

int main()
{
    printDirectory(".", 0);
    exit(0);
}

```

OUTPUT :

```
Student@prg33: ~/190905514/FIFTH-SEM/OS-LAB/LAB2
File Edit View Search Terminal Help
Student@prg33:~/190905514/FIFTH-SEM/OS-LAB/LAB2$ ls
190905514_MOHAMMAD_TOFIK_OS-LAB-2_62.odt  index.java  pgm1.c      pgm3.c
bazel.rc                                index.js    pgm1.png    pgm4.c
folder1                                index.tex   pgm2        saamp.png
folder2                                input.txt   pgm2.c      samplepgm1
index.html                             pgm1       pgm2.png    samplepgm1.c
Student@prg33:~/190905514/FIFTH-SEM/OS-LAB/LAB2$ gcc pgm2.c -o pgm2
Student@prg33:~/190905514/FIFTH-SEM/OS-LAB/LAB2$ ./pgm2
pgm2.png
pgm1.c
folder1/
  pgm2.png
  pgm1.c
  input.txt
  pgm4.c
  pgm1
  bazel.rc
  190905514_MOHAMMAD_TOFIK_OS-LAB-2_62.odt
  index.js
  samplepgm1
  pgm3.c
  index.tex
  pgm1.png
  pgm2.c
  pgm2
  samplepgm1.c
  saamp.png
  index.html
  index.java
folder2/
  pgm2.png
  pgm1.c
  input.txt
  pgm4.c
  pgm1
  bazel.rc
```

```
index.java
folder2/
  pgm2.png
  pgm1.c
  input.txt
  pgm4.c
  pgm1
  bazel.rc
  190905514_MOHAMMAD_TOFIK_OS-LAB-2_62.odt
  index.js
  samplepgm1
  pgm3.c
  index.tex
  pgm1.png
  pgm2.c
  pgm2
  samplepgm1.c
  saamp.png
  index.html
  index.java
input.txt
pgm4.c
pgm1
bazel.rc
190905514_MOHAMMAD_TOFIK_OS-LAB-2_62.odt
index.js
samplepgm1
pgm3.c
index.tex
pgm1.png
pgm2.c
.~lock.190905514_MOHAMMAD_TOFIK_OS-LAB-2_62.odt#
pgm2
samplepgm1.c
saamp.png
index.html
```

3.How do you list all installed programs in Linux?

Command : `dpkg -l` or `apt list`

OUTPUT :

```
Student@prg33: ~/190905514/FIFTH-SEM/OS-LAB/LAB2
File Edit View Search Terminal Help
Student@prg33:~/190905514/FIFTH-SEM/OS-LAB/LAB2$ dpkg -l
Desired=Unknown/Install/Remove/Purge/Hold
| Status=Not/Inst/Conf-files/Unpacked/halF-conf/Half-inst/trig-aWait/Trig-pend
|/ Err?=(none)/Reinst-required (Status,Err: uppercase=bad)
|/ Name Version Architecture Description
+++-+-----+-----+-----+-----+
ii  a11y-profile-mana 0.1.11-0ubunt amd64 Accessibility Profile Manager - Unity d
rc  account-plugin-go 0.12+16.04.20 all GNOME Control Center account plugin for
ii  accountsservice 0.6.45-1ubunt amd64 query and manipulate user account infor
ii  acl 2.2.52-3build amd64 Access control list utilities
ii  acpi-support 0.142 amd64 scripts for handling many ACPI events
ii  acpid 1:2.0.28-1ubu amd64 Advanced Configuration and Power Interf
ii  activity-log-mana 0.9.7-0ubuntu amd64 blacklist configuration user interface
ii  adduser 3.116ubuntu1 all add and remove users and groups
ii  adium-theme-ubunt 0.3.4-0ubuntu all Adium message style for Ubuntu
ii  adwaita-icon-them 3.28.0-1ubunt all default icon theme of GNOME (small subs
ii  aglfn 1.7-3 all Adobe Glyph List For New Fonts
ii  aisleriot 1:3.22.5-1 amd64 GNOME solitaire card game collection
ii  alsa-base 1.0.25+dfsg-0 all ALSA driver configuration files
ii  alsa-utils 1.1.3-1ubuntu amd64 Utilities for configuring and using ALS
ii  amd64-microcode 3.20191021.1+ amd64 Processor microcode firmware for AMD CP
ii  anacron 2.3-24 amd64 cron-like program that doesn't go by ti
ii  ant 1.10.5-3~18.0 all Java based build tool like make
ii  ant-optional 1.10.5-3~18.0 all Java based build tool like make - optio
ii  apg 2.2.3.dfsg.1- amd64 Automated Password Generator - Standalo
ii  app-install-data- 16.04 all Application Installer (data files for p
ii  apparmor 2.12-4ubuntu5 amd64 user-space parser utility for AppArmor
ii  appmenu-qt:amd64 0.2.7+14.04.2 amd64 application menu for Qt
rc  appmenu-qt5 0.3.0+16.04.2 amd64 application menu for Qt5
ii  apport 2.20.9-0ubunt all automatically generate crash reports fo
ii  apport-gtk 2.20.9-0ubunt all GTK+ frontend for the apport crash repo
ii  apport-symptoms 0.20 all symptom scripts for apport
ii  appstream 0.12.0-3ubunt amd64 Software component metadata management
```



```
Student@prg33: ~/190905514/FIFTH-SEM/OS-LAB/LAB2
File Edit View Search Terminal Help
zsh/bionic-updates,bionic-security 5.4.2-3ubuntu3.1 amd64
zsh-antigen/bionic,bionic 2.2.3-1 all
zsh-common/bionic-updates,bionic-updates,bionic-security,bionic-security 5.4.2-3ubuntu3.1 all
zsh-dev/bionic-updates,bionic-security 5.4.2-3ubuntu3.1 amd64
zsh-doc/bionic-updates,bionic-updates,bionic-security,bionic-security 5.4.2-3ubuntu3.1 all
zsh-static/bionic-updates,bionic-security 5.4.2-3ubuntu3.1 amd64
zsh-syntax-highlighting/bionic,bionic 0.6.0-1 all
zsh-theme-powerlevel9k/bionic,bionic 0.6.4-1 all
zshdb/bionic,bionic 0.92-3 all
zsnes/bionic 1.510+bz2-8build2 i386
zsnes-dbg/bionic 1.510+bz2-8build2 i386
zssh/bionic 1.5c.debian.1-4 amd64
zstd/bionic-updates,bionic-security 1.3.3+dfsg-2ubuntu1.2 amd64
zsync/bionic 0.6.2-3ubuntu1 amd64
ztclocalagent/bionic 5.0.0.30-0ubuntu2 amd64
ztex-bmp/bionic 20120314-2 amd64
zulucrypt-cli/bionic 5.4.0-2build1 amd64
zulucrypt-gui/bionic 5.4.0-2build1 amd64
zulumount-cli/bionic 5.4.0-2build1 amd64
zulumount-gui/bionic 5.4.0-2build1 amd64
zulupolkit/bionic 5.4.0-2build1 amd64
zulusafe-cli/bionic 5.4.0-2build1 amd64
zurl/bionic 1.9.1-1ubuntu1 amd64
zutils/bionic 1.7-1 amd64
zvbi/bionic 0.2.35-13 amd64
zygrib/bionic 8.0.1+dfsg.1-1 amd64
zygrib-maps/bionic,bionic 8.0.1+dfsg.1-1 all
zynadd/bionic 1+git.20100609+dfsg0-4 amd64
zynaddsubfx/bionic 3.0.3-1 amd64
zynaddsubfx-data/bionic,bionic 3.0.3-1 all
zynaddsubfx-dssi/bionic 3.0.3-1 amd64
zyne/bionic,bionic 0.1.2-2 all
zziplib-bin/bionic-updates,bionic-security 0.13.62-3.1ubuntu0.18.04.1 amd64
zzuf/bionic 0.15-1 amd64
Student@prg33: ~/190905514/FIFTH-SEM/OS-LAB/LAB2$
```

4. How do you find out what RPM packages are installed on Linux?

Command : rpm -qa

```
Student@prg33: ~/190905514/FIFTH-SEM/OS-LAB/LAB2
File Edit View Search Terminal Help
Student@prg33: ~/190905514/FIFTH-SEM/OS-LAB/LAB2$ rpm -qa
Student@prg33: ~/190905514/FIFTH-SEM/OS-LAB/LAB2$
```

