

OS LAB 2

Q1. 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

CODE

=>

```
#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* d= opendir("/home/student/Documents/190905076/OSL/L1");
```

```
    char* buff;
```

```
    DIR* dad;
```

```
    if(d==NULL) {          printf("Directory
```

```
not accessible:\n");
```

```
        exit(0);
```

```
    }
```

```
    struct dirent *item;
```

```
    struct stat mystat;
```

```
        //struct tm *foo;
```

```
        //foo = gmtime(mystat.st_mtime);
```

```
        while((item=readdir(d))!=NULL){
```

```
            lstat(item->d_name,&mystat);
```

```

        //d or -
        if(S_ISDIR(mystat.st_mode)){
            if(strcmp(".",item->d_name)==0 ||
strcmp("../",item->d_name)==0) continue;
            printf("d");
        }
        else printf("-");

//User, group and other perimissions
if(mystat.st_mode & S_IRUSR){
    printf("r");
}
else printf("-");
if(mystat.st_mode & S_IWUSR){
    printf("w");
}
else printf("-");
if(mystat.st_mode & S_IXUSR){
    printf("x");
}
else printf("-");

if(mystat.st_mode & S_IRGRP){
    printf("r");
}

```

```
        else printf("-");
        if(mystat.st_mode & S_IWGRP){
            printf("w");
        }
        else printf("-");
    if(mystat.st_mode & S_IXGRP){
        printf("x");
    }
    else printf("-");
```

```

        if(mystat.st_mode & S_IROTH){
            printf("r");
        }
        else printf("-");
    if(mystat.st_mode & S_IWOTH){
        printf("w");
    }
    else printf("-");
    if(mystat.st_mode & S_IXOTH){
        printf("x\t");
    }
    else printf("-\t");
```

```
        //Directory or File
    if(S_ISDIR(mystat.st_mode)){
        printf("2\t");
```

```

    }

    else printf("1\t");

    buff = getlogin();

    printf("%s\t",buff);

    //Name of item in consideration

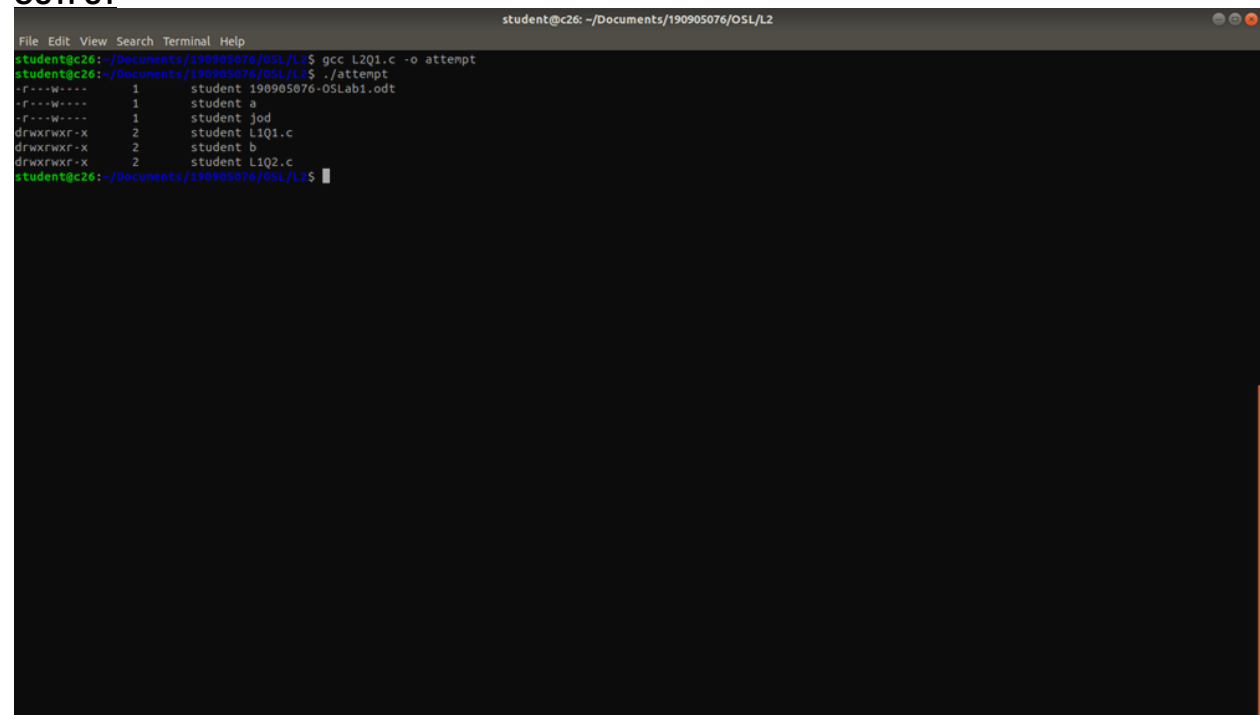
    printf("%s\n",item->d_name);

}

}

```

OUTPUT



```

student@c26: ~/Documents/190905076/OSL/L2$ gcc L2Q1.c -o attempt
student@c26:~/Documents/190905076/OSL/L2$ ./attempt
-r---w----- 1 student 190905076-05Lab1.odt
-r---w----- 1 student a
-r---w----- 1 student jod
drwxrwxr-x 2 student L1Q1.c
drwxrwxr-x 2 student b
drwxrwxr-x 2 student L1Q2.c
student@c26:~/Documents/190905076/OSL/L2$

```

Q2. Write a program that will list all files in a current directory and all files in subsequent subdirectories

CODE

=>

```
#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>
```

```
void function(char* dir, int depth){    DIR* d;        struct
```

```
dirent* item;        struct stat mystat;
```

```
if((d=opendir(dir))==NULL){
```

```
fprintf(stderr,"Directory isn't opening:\n",dir);
```

```
    return;
```

```
}
```

```
    chdir(dir);    while((item =
```

```
readdir(d))!=NULL){
```

```
    lstat(item->d_name,&mystat);
```

```
    if(S_ISDIR(mystat.st_mode)){
```

```
        if(strcmp(".",item-
```

```
>d_name)==0 || strcmp("..",item->d_name)==0){
```

```
            continue;
```

```
    }
```

```
        printf("%s%s/\n",depth,"",item->d_name);
```

```
        function(item-
```

```
>d_name,depth+4);
```

```

    }

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

}

chdir("../");

closedir(d);

}

int main(){ function("/mnt/c/Users/steph/Documents/190905076_OSLAB",0);

exit(0);

}

```

OUTPUT

```

stephenjames@LAPTOP-7CHVKKFA: /mnt/c/Users/steph/Documents/190905076_OSLAB/Lab2$ gcc L2Q2.c -o op
L2Q2.c: In function 'function':
L2Q2.c:15:24: warning: too many arguments for format [-Wformat-extra-args]
    printf(stderr,"Directory isn't opening:\n",dir);
                   ^~~~~~
stephenjames@LAPTOP-7CHVKKFA: /mnt/c/Users/steph/Documents/190905076_OSLAB/Lab2$ ./op
a/
L1Q2.c/
l1q2text.txt/
L1Q3.c/
L1Q3.c/
L1Q4.c/
Lab2/
L2Q1.c/
L2Q2.c/
op/
text.txt/
stephenjames@LAPTOP-7CHVKKFA: /mnt/c/Users/steph/Documents/190905076_OSLAB/Lab2$ 

```

Q3. How do you list all installed programs in linux

CODE

=>

```
student@c26: ~/Documents/190905076/OSL/L2
File Edit View Search Terminal Help

student@c26:~/Documents/190905076/OSL/L2$ apt list --installed
Listing... Done
accountsservice/bionic-updates,bionic-security,now 0.6.45-1ubuntu1.3 amd64 [installed]
acl/bionic,now 2.2.52-3build1 amd64 [installed]
acpi-support/bionic,now 0.142 amd64 [installed]
acpid/bionic,now 1:2.0.28-1ubuntu1 amd64 [installed]
adduser/bionic,bionic,now 3.116ubuntu1 all [installed]
adwaita-theme-ubuntu/bionic,bionic,now 0.3.4-0ubuntu4 all [installed]
adwaita-icon-theme/bionic,bionic,now 3.28.0-1ubuntu1 all [installed]
aglfn/bionic,bionic,now 1.7-3 all [installed,automatic]
aisleriot/bionic,now 1:3.22.5-1 amd64 [installed]
alsa-base/bionic,bionic,now 1.0.25+dfsg-0ubuntu5 all [installed]
alsa-utils/bionic,now 1.1.3-1ubuntu1 amd64 [installed]
amd64-microcode/bionic-updates,bionic-security,now 3.20191021.1+really3.20181128.1-ubuntu0.18.04.1 amd64 [installed,automatic]
anacron/bionic,now 2.3-24 amd64 [installed]
app/bionic,now 2.2.3.dfsg.1-5 amd64 [installed]
app-install-data-partner/bionic,bionic,now 16.04 all [installed]
apparmor/bionic-updates,bionic-security,now 2.12-4ubuntu5.1 amd64 [installed]
appport/bionic-updates,bionic-updates,bionic-security,bionic-security,now 2.20.9-0ubuntu7.26 all [installed]
appport-gtk/bionic-updates,bionic-updates,bionic-security,bionic-security,now 2.20.9-0ubuntu7.26 all [installed]
appport-symptoms/bionic,bionic,now 0.20 all [installed]
appstream/bionic-updates,now 0.12.0-3ubuntu1 amd64 [installed]
apt/bionic-security,now 1.6.12ubuntu0.2 amd64 [installed,upgradable to: 1.6.14]
apt-config-icons/bionic-updates,bionic-updates,now 0.12.0-3ubuntu1 all [installed]
apt-utils/bionic-security,now 1.6.12ubuntu0.2 amd64 [installed,upgradable to: 1.6.14]
aptdaemon/bionic-updates,bionic-updates,bionic-security,bionic-security,now 1.1.1+bzr982-0ubuntu19.5 all [installed]
aptdaemon-data/bionic-updates,bionic-updates,bionic-security,bionic-security,now 1.1.1+bzr982-0ubuntu19.5 all [installed]
apturl/bionic-updates,now 0.5.2ubuntu14.2 amd64 [installed]
apturl-common/bionic-updates,now 0.5.2ubuntu14.2 amd64 [installed]
aspell/bionic-updates,bionic-security,now 0.60.7-20110707-4ubuntu0.2 amd64 [installed]
aspell-en/bionic,bionic,now 2017.08.24-0-0.1 all [installed]
asymptote/bionic,now 2.41-4 amd64 [installed,automatic]
asymptote-doc/bionic,bionic,now 2.41-4 all [installed,automatic]
at-spi2-core/bionic,now 2.28.0-1 amd64 [installed]
augeas-lenses/bionic,bionic,now 1.10.1-2 all [installed,upgradable to: 1.10.1-2ubuntu1]
avahi-autoipd/bionic-updates,bionic-security,now 0.7-3.1ubuntu1.3 amd64 [installed]
avahi-daemon/bionic-updates,bionic-security,now 0.7-3.1ubuntu1.3 amd64 [installed]
avahi-utils/bionic-updates,bionic-security,now 0.7-3.1ubuntu1.3 amd64 [installed]
baobab/bionic,now 3.28.0-1 amd64 [installed]
base-files/now 10.1ubuntu2.10 amd64 [installed,upgradable to: 10.1ubuntu2.11]
base-passwd/bionic,now 3.5.44 amd64 [installed]
bash/bionic-updates,now 4.4.19-2ubuntu1.2 amd64 [installed]
bash-completion/bionic,bionic,now 1:2.0-1ubuntu1 all [installed]
bastet/bionic,now 0.43-4build5 amd64 [installed]
bc/bionic,now 1.07.1-2 amd64 [installed]
```

Q4. How do you find out what RPM packages are installed in Linux

CODE

```
student@c26: ~/Documents/190905076/OSL/L2
File Edit View Search Terminal Help
student@c26:~/Documents/190905076/OSL/L2$ rpm -qa
Command 'rpm' not found, but can be installed with:
sudo apt install rpm
student@c26:~/Documents/190905076/OSL/L2$
```