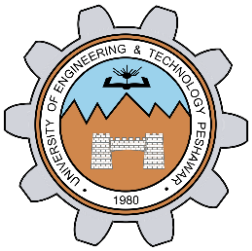
SP LAB REPORT

FILES AND DIRECTORIES

LAB # 08



Fall 2023

CSE-302L Systems Programming Lab

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Class Section: **C**

"On my honor, as student of University of Engineering and Technology, I have neither given nor received unauthorized assistance on this academic work."

Submitted to:

Engr. Abdullah Hamid

DATED: 28 \01 \2024

Department of Computer Systems Engineering

University of Engineering and Technology, Peshawar

SP LAB REPORT

OBJECTIVES:

- To learn about UNIX Files and Directories.
- To learn about Directory opening and reading

Tasks:

Task 01:

Implement ls command.

Code :

T1.c T2.c

T1.c > main(int, char * [])

```c
#include <unistd.h>
#include <string.h>
#include <stdio.h>
#include <dirent.h>

int main(int argc, char *argv[])
{
    DIR *dirp;
    dirp = opendir(argv[1]);
    if (dirp == NULL)
    {
        perror("Failed to open directory");
        return -1;
    }
    struct dirent *direntp;
    while ((direntp = readdir(dirp)) != NULL)
    {
        if (strcmp(direntp->d_name, ".") == 0)
        {
            continue;
        }
        if (strcmp(direntp->d_name, "..") == 0)
        {
            continue;
        }
        printf("Name %s\t Inode# %ld\n", direntp->d_name, direntp->d_ino);
    }
}
```

Output:

```
Name Systems Programming Lab # 8.pdf     Inode# 5005
Name t1  Inode# 5016
Name T1.c        Inode# 5000
Name t2  Inode# 5002
Name T2.c        Inode# 5004
Name Lab 01      Inode# 1173
Name Lab 02      Inode# 1207
Name Lab 03      Inode# 4336
Name Lab 04      Inode# 4013
Name Lab 05      Inode# 4665
Name Lab 06      Inode# 4720
Name Lab 07      Inode# 4895
Name Lab 08      Inode# 4999
Name Lab Reports         Inode# 1214
Name SPLab New Rubrics.pdf       Inode# 1172
```

Task 02:

Implement ls -l command.

Code :

T1.c | T2.c

T2.c > main(int, char * [])

```c
#include <stdio.h>
#include <string.h>
#include <stdlib.h>
#include <unistd.h>
#include <sys/stat.h>
#include <sys/types.h>
#include <time.h>
#include <dirent.h>
#include <libgen.h>
#include <pwd.h>
#include <grp.h>
// char *ctime(const time_t *timex);

int main(int argc, char *argv[])
{

    time_t curtime;
    time(curtime);
    DIR *dirp = opendir(argv[1]);
    struct dirent *direntp;
    struct stat st;
    while ((direntp = readdir(dirp)) != NULL)
    {
        if (strcmp(direntp->d_name, ".") == 0)
        {
            continue;
        }
        if (strcmp(direntp->d_name, "..") == 0)
        {
            continue;
        }
        int r = stat(direntp->d_name, &st);
        if (r == -1)
        {
            perror("Stat Failed");
        }
        if (S_ISDIR(st.st_mode))
        {
            printf("d");
        }
```

```
41          else
42          {
43              printf("-");
44          }
45          if (st.st_mode & S_IRUSR)
46          {
47              printf("r");
48          }
49          else
50          {
51              printf("-");
52          }
53          if (st.st_mode & S_IWUSR)
54          {
55              printf("w");
56          }
57          else
58          {
59              printf("-");
60          }
61          if (st.st_mode & S_IXUSR)
62          {
63              printf("x");
64          }
65          else
66          {
67              printf("-");
68          }
69          if (st.st_mode & S_IRGRP)
70          {
71              printf("r");
72          }
73          else
74          {
75              printf("-");
76          }
77          if (st.st_mode & S_IWGRP)
78          {
79              printf("w");
80          }
81          else
82          {
83              printf("-");
84          }
85          if (st.st_mode & S_IXGRP)
86          {
87              printf("x");
88          }
89          else
90          {
91              printf("-");
92          }
93          if (st.st_mode & S_IROTH)
94          {
95              printf("r");
96          }
97          else
98          {
99              printf("-");
100         }
101         if (st.st_mode & S_IWOTH)
102         {
103             printf("w");
104         }
105         else
106         {
107             printf("-");
108         }
109         if (st.st_mode & S_IXOTH)
110         {
111             printf("x\t");
112         }
113         else
114         {
115             printf("x\t");
116         }
117         printf("%ld\t", st.st_nlink);
118         struct passwd *p;
119         p = getpwuid(st.st_uid);
120         printf("%s\t", p->pw_name);
```

```
121         struct group *g;
122         g = getgrgid(st.st_gid);
123         printf("%s\t", g->gr_name);
124         printf("%ld\t", st.st_size);
125         printf("%s\t", ctime(&st.st_atime));
126         printf("%s\n", direntp->d_name);
127     }
128     return 0;
129 }
```

Output:

```
T2.c: In function 'main':
T2.c:18:10: warning: passing argument 1 of 'time' makes pointer from
   18 |     time(curtime);
      |          ^~~~~~~
      |          |
      |          time_t {aka long int}
In file included from T2.c:7:
/usr/include/time.h:76:29: note: expected 'time_t *' {aka 'long int *
   76 | extern time_t time (time_t *__timer) __THROW;
      |                    ~~~~~~~~^~~~~~
- rwxrwxrwx          1
                Systems  Programm
- rwxrwxrwx          1
                t1
- rwxrwxrwx          1
                T1.c
- rwxrwxrwx          1
                t2
- rwxrwxrwx          1
                T2.c
```