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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

UCS1411 - OPERATING SYSTEMS LAB

Lab Exercise 2

Implementation of System calls

Cp command:

mycp.c

```
#include<stdio.h>
#include <fcntl.h>
#include<errno.h>
#include<sys/types.h>
#include<sys/stat.h>
#include<string.h>

void main(int argc,char** argv)
{

    char buf[100];

    int c=creat(argv[2],777);
    if(c==-1)
    {
        printf("Cannot create file %s.\n",argv[2]);
    }

    int f1=open(argv[1],O_RDONLY);
    int f2=open(argv[2],O_WRONLY);
```

```

    if(f1==-1)
    {
        printf("Error in opening:%s.\n",argv[1]);
    }

    if(f2==-1)
    {
        printf("Error in opening:%s.\n",argv[2]);
    }

    int r=read(f1,&buf,50);
    r=write(f2,buf,strlen(buf));

    printf("Copy Successful\n");

    close(f1);
    close(f2);

}

/*
[csec159@sel-16 ~]$ cat hello
hello there
[csec159@sel-16 ~]$ gcc -o a mycp.c
[csec159@sel-16 ~]$ ./a hello copy
Copy Successful
[csec159@sel-16 ~]$ cat copy
hello there
*/

```

mycp.c

```

#include <stdio.h>
#include <stdlib.h>
#include <unistd.h>
#include <fcntl.h>
#define SIZE 1024

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

    int srcFD,destFD,nRead,nWrite;
    char buff[SIZE],ch;

```

```

srcFD = open(argv[1],O_RDONLY);

if(srcFD==-1){
    printf("File does not exist!");
}

destFD = open(argv[2],O_WRONLY);
if(destFD==-1){
    destFD = open(argv[2],O_WRONLY|O_CREAT);
    if(destFD!=-1)
        goto cp;
}

else{
    printf("Do you want to overwrite '%s'? ",argv[2]);
    scanf(" %c",&ch);
    if(ch=='y')
        goto cp;
}

cp:
    while((nRead = read(srcFD,buff,SIZE)) > 0){
        if(write(destFD,buff,nRead) != nRead)
            printf("\nError in writing data to file");
        else
        {
            printf("Copy successful!");
        }
    }

    if(nRead == -1)
        printf("\nError in reading data from %s\n",argv[1]);

    if(close(srcFD) == -1)
        printf("\nError in closing file %s\n",argv[1]);

    if(close(destFD) == -1)
        printf("\nError in closing file %s\n",argv[2]);
}

/*

```

C:\Users\Sowmya\Desktop\Sowmya\Lab\OS\A2>type file.txt

Back when dinosaurs existed, there used to be volcanoes that were erupting on the moon.

```
C:\Users\Sowmya\Desktop\Sowmya\Lab\OS\A2>gcc -o a mycpi.c
```

```
C:\Users\Sowmya\Desktop\Sowmya\Lab\OS\A2>a file.txt copy
```

Copy successful!

```
C:\Users\Sowmya\Desktop\Sowmya\Lab\OS\A2>type copy
```

Back when dinosaurs existed, there used to be volcanoes that were erupting on the moon.

```
C:\Users\Sowmya\Desktop\Sowmya\Lab\OS\A2>type file1.txt
```

Sunflowers can help clean radioactive soil. Japan is using this to rehabilitate Fukushima. Almost 10,000 packets of sunflower seeds have been sold to the people of the city.

```
C:\Users\Sowmya\Desktop\Sowmya\Lab\OS\A2>a file1.txt copy
```

Do you want to overwrite 'copy'? y

Copy successful!

```
C:\Users\Sowmya\Desktop\Sowmya\Lab\OS\A2>type copy
```

Sunflowers can help clean radioactive soil. Japan is using this to rehabilitate Fukushima. Almost 10,000 packets of sunflower seeds have been sold to the people of the city.

*/

mys.c

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

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

```
void main(int argc,char** argv)
```

```
{
```

```
    struct dirent *de;
```

```
    DIR *dptr = opendir("lab");
```

```
    if (dptr == NULL)
```

```
    {
```

```
        printf("Could not open current directory" );
```

```

    }

    while ((de= readdir(dptr))!= NULL)
        printf("%s\n", de->d_name);

    closedir(dptr);
}

/*
[csec159@sel-16 ~]$ ls lab
1  2  3  os

[csec159@sel-16 ~]$ gcc -o a myls.c
[csec159@sel-16 ~]$ ./a
.
..
2
1
os
3
*/

```

mylsl.c

```

#include <unistd.h>
#include <stdio.h>
#include <sys/stat.h>
#include <sys/types.h>
#include <dirent.h>
#include <time.h>

int main(int argc, char **argv)
{
    DIR *dp;
    struct dirent *dirp;

    if ((dp = opendir(argv[1])) == NULL)
        printf("ERROR! Unable to open %s", argv[1]);

    while ((dirp = readdir(dp)) != NULL){
        struct stat fileStat;
        stat(dirp->d_name,&fileStat);

        printf( (S_ISDIR(fileStat.st_mode)) ? "d" : "-");
        printf( (fileStat.st_mode & S_IRUSR) ? "r" : "-");
    }
}

```

```

        printf( (fileStat.st_mode & S_IWUSR) ? "w" : "-");
        printf( (fileStat.st_mode & S_IXUSR) ? "x" : "-");
        printf( (fileStat.st_mode & S_IRGRP) ? "r" : "-");
        printf( (fileStat.st_mode & S_IWGRP) ? "w" : "-");
        printf( (fileStat.st_mode & S_IXGRP) ? "x" : "-");
        printf( (fileStat.st_mode & S_IROTH) ? "r" : "-");
        printf( (fileStat.st_mode & S_IWOTH) ? "w" : "-");
        printf( (fileStat.st_mode & S_IXOTH) ? "x" : "-");
        printf("\t");
        printf("%d ",fileStat.st_nlink);
        printf("%ld ",(long)fileStat.st_uid);
        printf("%ld ",(long)fileStat.st_gid);
        printf("%lld", (long long)fileStat.st_size);
        printf("\t%s ",ctime(&fileStat.st_mtime));
        printf(dirp->d_name);
        printf("\n");

    }
    return 0;
}

```

/*

C:\Users\Sowmya\Desktop\Sowmya\Lab\OS\A2>gcc -o a myls1.c

C:\Users\Sowmya\Desktop\Sowmya\Lab\OS\A2>a .

```

drwxrwxrwx      1  0  0  0      Wed Jan 15 16:45:17 2020
.
drwxrwxrwx      1  0  0  0      Tue Jan 14 23:01:12 2020
..
-rwxrwxrwx      1  0  0 148204 Wed Jan 15 16:45:17 2020
a.exe
-rw-rw-rw-      1  0  0  83      Wed Jan 15 16:01:01 2020
file.txt
-rw-rw-rw-      1  0  0  173     Wed Jan 15 01:56:23 2020
file1.txt
-rw-rw-rw-      1  0  0  0       Wed Jan 15 01:46:23 2020
hello
-rw-rw-rw-      1  0  0  780     Tue Jan 14 23:02:03 2020
mycp.c
-rw-rw-rw-      1  0  0  1945    Wed Jan 15 01:57:25 2020
mycpi.c
-rw-rw-rw-      1  0  0  1051    Tue Jan 14 23:02:14 2020
mygrep.c
-rw-rw-rw-      1  0  0  777     Wed Jan 15 02:13:18 2020
mygrepc.c
-rw-rw-rw-      1  0  0  704     Wed Jan 15 15:59:18 2020
mygrepn.c
-rw-rw-rw-      1  0  0  778     Wed Jan 15 16:02:06 2020

```

```

mygrepv.c
-rw-rw-rw-    1  0  0  483    Tue Jan 14 23:02:09 2020
myls.c
-rw-rw-rw-    1  0  0  1398   Wed Jan 15 16:45:14 2020
mylsl.c
-rw-rw-rw-    1  0  0  570    Wed Jan 15 16:06:35 2020
mylsr.c
drwxrwxrwx    1  0  0  0      Wed Jan 15 16:04:48 2020
sample
*/

```

myslr.c

```

#include <stdio.h>
#include <sys/types.h>
#include <dirent.h>

int main(int argc,int *argv[])
{
    struct dirent *dp;

    DIR *dir = opendir(argv[1]);

    if (!dir)
        printf("Error in opening Directory.\n");

    while ((dp = readdir(dir)) != NULL)
    {
        printf("%s\n", dp->d_name);
    }

    closedir(dir);
    return 0;
}

/*
C:\Users\Sowmya\Desktop\Sowmya\Lab\OS\A2>gcc -o a mylsr.c
C:\Users\Sowmya\Desktop\Sowmya\Lab\OS\A2>a .
.
..
a.exe
file.txt
file1.txt
hello
mycp.c

```

```
mycpi.c
mygrep.c
mygrepc.c
mygrepn.c
mygrepv.c
myls.c
mylsr.c
sample
*/
```

mygrep.c

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

void main(int argc,char *argv[])
{
    int fd,c,i=0,count=0;

    char ch,line[100];

    if((fd=open(argv[2],O_RDONLY))!= -1)
    {
        while((c=read(fd,&ch,sizeof(char)))!= 0)
        {
            if(ch!='\n')
            {
                line[i]=ch;
                i++;
            }
            else
            {
                line[i]='\0';
                if(strstr(line,argv[1])!=NULL)
                {
                    count++;
                    printf("%s\n",line);
                }

                strcpy(line,"");
            }
        }
    }
}
```



```

        i=0;
    }

}

printf("No. of occurence=%d\n",count);
}
}

/*
[csec159@sel-16 ~]$ cat hello
hello there
I just wanted to say hello
hello is a nice word
Just say hello
yolo
You only live once

[csec159@sel-16 ~]$ gcc -o a mygrep.c
[csec159@sel-16 ~]$ ./a hello hello
hello there
I just wanted to say hello
hello is a nice word
Just say hello
No. of occurence=4
*/

```

mygrepc.c

```

#include<stdio.h>
#include<unistd.h>
#include<sys/stat.h>
#include<fcntl.h>
#include<string.h>
#include<sys/types.h>

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

    int fd,i=0,count=0;
    int r;

    char line[200];
    char c;

```

```

if((fd=open(argv[2],O_RDONLY))!=0)
{

    while((r=read(fd,&c,sizeof(char)))!=0)
    {
        if(c!='\n')
        {
            line[i++]=c;
        }

        else
        {
            line[i]='\0';

            if(strstr(line,argv[1])!=NULL)
            {
                count++;
            }

            memset(line,0,sizeof(line));
            i=0;
        }
    }
}

printf("Count=%d",count);

return 0;
}

/*
C:\Users\Sowmya\Desktop\Sowmya\Lab\OS\A2>type file.txt
Who am I?
I am Sowmya.
I am a student at SSN.

C:\Users\Sowmya\Desktop\Sowmya\Lab\OS\A2>gcc -o b mygrepc.c
C:\Users\Sowmya\Desktop\Sowmya\Lab\OS\A2>b am file.txt
Count=3

*/

```

mygrepv.c

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

```

#include<unistd.h>
#include<sys/stat.h>
#include<fcntl.h>
#include<string.h>
#include<sys/types.h>

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

    int fd,r,i=0;
    char line[100];
    char c;

    if((fd=open(argv[2],O_RDONLY))!=0)
    {

        while((r=read(fd,&c,sizeof(char)))!=0)
        {
            if(c!='\n')
            {
                line[i++]=c;
            }

            else
            {
                line[i]='\0';
                if(strstr(line,argv[1])!=NULL)
                    printf("%s\n",line);
                memset(line,0,sizeof(line));
                i=0;
            }
        }
    }

    return 0;
}

/*
C:\Users\Sowmya\Desktop\Sowmya\Lab\OS\A2>type file.txt
Who am I?
I am Sowmya.
I am a student at SSN.
I like to read crime thrillers.

C:\Users\Sowmya\Desktop\Sowmya\Lab\OS\A2>gcc -o a mygrepv.c

C:\Users\Sowmya\Desktop\Sowmya\Lab\OS\A2>a am file.txt
I like to read crime thrillers.*/

```

mygrepn.c

```
#include<stdio.h>
#include<unistd.h>
#include<sys/stat.h>
#include<fcntl.h>
#include<string.h>
#include<sys/types.h>

int main(int argc, char **argv)
{
    int fd,r,i=0,lineno=1;
    char line[100];
    char c;
    if((fd=open(argv[2],O_RDONLY))!=0)
    {
        while((r=read(fd,&c,sizeof(char)))!=0)
        {
            if(c!='\n')
            {
                line[i++]=c;
            }
            else
            {
                line[i]='\0';
                if(strstr(line,argv[1])!=NULL)
                    printf("%d. %s\n",lineno,line);
                memset(line,0,sizeof(line));
                i=0;
                lineno++;
            }
        }
    }

    return 0;
}

/*
C:\Users\Sowmya\Desktop\Sowmya\Lab\OS\A2>gcc -o a mygrepn.c

C:\Users\Sowmya\Desktop\Sowmya\Lab\OS\A2>a am file.txt
1. Who am I?
2. I am Sowmya.
3. I am a student at SSN.

*/
```