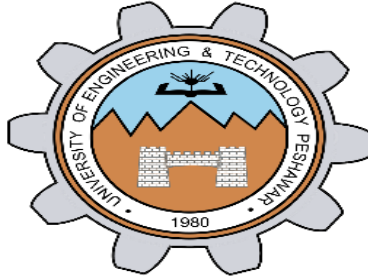


Lab report no 7



Fall 2021

Computer System Programming Lab

Submitted By

Names

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(First two tasks are continuation of lab 6).

Task no 1: -

There are three parts of task 1.

- i) cat implementation in which user input some content in STDIN_FILENO and print the content in STDOUT_FILENO.
- ii) cat "filename" implementation of this command takes first argument command and display by STDIN_FILENO, means it the content of the filename.
- iii) cat file>file2, its implementation copies the content of first argument file to second argument file.

Code: -

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

```
int main(int arg, char *argc[])
```

```
{
```

```
char buf[1024];
```

```
int src,des;
```

```
if (arg==1)
```

```
{
```

```
src=STDIN_FILENO;
```

```
des=STDIN_FILENO;
```

```
}
```

```
else if (arg==2){
```

```

src=open(argc[1],O_RDONLY);
des=STDOUT_FILENO;
}

else if (arg==4 && argc[2]==">")
{
src=open(argc[1],O_RDONLY);
    des=open(argc[2],O_WRONLY | O_CREAT | O_TRUNC, S_IRUSR | S_IWUSR);

}

int rd,wr;
while((rd = read(src,buf,sizeof(buf)))>0)
{
    wr = write(des,buf,rd);

    if (rd==-1 || wr==-1)
{
    perror("fail: ");
}

}

close(src);
close(des);

return 0;

}

```

Output: -

i).

```
muhammad@muhammad-VirtualBox: ~/labs/cse302
muhammad@muhammad-VirtualBox:~/labs/cse302$ gcc lab6task1.c -o lab6task1
muhammad@muhammad-VirtualBox:~/labs/cse302$ ./lab6task1
mali
mali
1801
1801
uet
uet
█
```

ii).

```
muhammad@muhammad-VirtualBox:~/labs/cse302$ ./lab6task1 file.txt
ali
khan
muhammad@muhammad-VirtualBox:~/labs/cse302$ █
```

iii).

```
muhammad@muhammad-VirtualBox: ~/labs/cse302
muhammad@muhammad-VirtualBox:~/labs/cse302$ gedit lab6task1.c &
[2] 2276
muhammad@muhammad-VirtualBox:~/labs/cse302$ gcc lab6task1.c -o lab6task1
[2]+  Done                  gedit lab6task1.c
muhammad@muhammad-VirtualBox:~/labs/cse302$ ./lab6task1 file.txt > file1.txt
muhammad@muhammad-VirtualBox:~/labs/cse302$ cat file.txt
ali
khan
muhammad@muhammad-VirtualBox:~/labs/cse302$ cat file.txt
ali
khan
muhammad@muhammad-VirtualBox:~/labs/cse302$
```

Task no 2: -

This task is continuation of 3rd part of task 1 but here content of one file is copied to another by parallel file copying using multiple processes.

Code: -

```
#include<stdio.h>

#include<unistd.h>

#include<error.h>

#include<fcntl.h>

#include<sys/wait.h>


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


char buf[1024];

int src,des;


    if (arg<2)
    {
        printf("no file for parallel coping");
    }


    if (arg%2!=0){


        for (int i=1; i<arg; i+=2)
        {


            int r,w;
```

```

int c1=fork();

if (c1==0)
{
src= open (argv[i], O_RDONLY);

    if(src==-1)
    {
        perror("Failed to open file for reading");
        return -1;
    }

des= open (argv[i+1],O_WRONLY | O_CREAT|O_TRUNC, S_IRUSR|S_IWUSR);

    if(des==-1)
    {
        perror("Failed to open file for writing");
        return -1;
    }

while((r=read(src,buf,sizeof(buf)))>0)
{
    w= write(des,buf, r);

    if (r==-1 || w==-1)
    {
        perror("fail reading wrting: ");
    }
}

```

```

        break;
    }
}

for (int i=1; i<=(arg/2); i++)
{
    wait(NULL);
}
}
}

else
{
    printf("no destination file");
}

close(src);
close(des);
return 0;
}

```

Output: -

```

muhammad@muhammad-VirtualBox: ~/labs/cse302
muhammad@muhammad-VirtualBox:~/labs/cse302$ gedit lab6task2.c &
[2] 2342
muhammad@muhammad-VirtualBox:~/labs/cse302$ gcc lab6task2.c -o lab6task2
[2]+  Done                  gedit lab6task2.c
muhammad@muhammad-VirtualBox:~/labs/cse302$ ./lab6task2 file2.txt file3.txt
Muhammad ali
khan
regno.1801
muhammad@muhammad-VirtualBox:~/labs/cse302$ cat file2.txt
Muhammad ali
khan
regno.1801
muhammad@muhammad-VirtualBox:~/labs/cse302$ cat file3.txt
Muhammad ali
khan
regno.1801
muhammad@muhammad-VirtualBox:~/labs/cse302$

```

Task no 3: -

Program to monitor two files using select system call.

```
#include<stdio.h>
#include<unistd.h>
#include<error.h>
#include<fcntl.h>
#include<sys/select.h>

char buff[1000];
int main( int arg, char *argv[])
{
    int fd1= open (argv[1], O_RDONLY);
    int  fd2= open (argv[2], O_RDONLY);

    int max,r,w;

    max=(fd1>fd2)? fd1:fd2;

    fd_set readset;
    FD_ZERO(&readset);

    FD_SET(fd1,&readset);
    FD_SET(fd2,&readset);

    int n=select(max+1, &readset,NULL,NULL,NULL);

    printf("no of files ready %d ", n);

    if(n==-1)
    {
        perror("Failed to open file for reading");
        return -1;
    }

    if (FD_ISSET(fd1,&readset))
    {
```



```

r=read(fd1, buff, sizeof(buff));
w=write(STDOUT_FILENO,buff, r);

if (r==-1 || w==-1)
{
    perror("failed :");
}

}

if (FD_ISSET(fd2, &readset))

{
    r=read(fd2, buff, sizeof(buff));
    w=write(STDOUT_FILENO,buff,r);

    if (r==-1 || w==-1)
    {
        perror("failed :");
    }
}

close(fd1);
close(fd2);

return 0;
}

```

Output: -

```

muhammad@muhammad-VirtualBox: ~/labs/cse302
muhammad@muhammad-VirtualBox:~/labs/cse302$ cat file.txt
file1
ali
khan
muhammad@muhammad-VirtualBox:~/labs/cse302$ cat file1.txt
file2
ali
khan
1801
muhammad@muhammad-VirtualBox:~/labs/cse302$ gcc lab7task3.c -o lab7task3
muhammad@muhammad-VirtualBox:~/labs/cse302$ ./lab7task3 file.txt file1.txt
file1
ali
khan
file2
ali
khan
1801
no of files ready 2 muhammad@muhammad-VirtualBox:~/labs/cse302$

```

Task no 4: -

Program to monitor N no of files using select system call.

```
#include <stdio.h>
#include <sys/select.h>
#include <time.h>
#include <unistd.h>
#include <fcntl.h>
#include <sys/stat.h>
#include <errno.h>
#include <string.h>

int main(int arg, char *argv[])
{
    if(arg<2)
    {
        printf("Invalid Number of Arguments\n");
        return -1;
    }

    int fd[arg-1];
    for(int i=0;i<arg-1;i++)
    {
        fd[i] = open(argv[i+1],O_RDONLY);
        if(fd[i]==-1)
        {
            printf("Failed to open the file %s: %s",argv[i+1],strerror(errno));
            return -1;
        }
    }

    fd_set readSet;
    FD_ZERO(&readSet);

    for(int i=0;i<arg-1;i++)
    {
        FD_SET(fd[i],&readSet);
    }

    int max = fd[0];

    for(int i=0;i<arg-1;i++)
    {
```

```

        if(fd[i]>max)
            max = fd[i];
    }

    int nfd = select(max+1,&readSet,NULL,NULL,NULL);

    if(nfd==-1)
    {
        perror("selection failed \n");
        return -1;
    }

    printf("files ready are : %d\n",nfd);

    for(int i=0;i<arg-1;i++)
    {
        if(FD_ISSET(fd[i],&readSet))
            printf(" \nready files: %s",argv[i+1]);
        else
            printf("\n file not ready: %s",argv[i+1]);
    }
    return 0;
}

```

Output: -

```

muhammad@muhammad-VirtualBox:~/labs/cse302$ gcc lab7task4.c -o lab7task4
muhammad@muhammad-VirtualBox:~/labs/cse302$ ./lab7task4 file.txt file1.txt file2.txt
files ready are : 3

ready files: file.txt
ready files: file1.txt
ready files: file2.txtmuhammad@muhammad-VirtualBox:~/labs/cse302$

```

Task no 5: -

Program to monitor files using select system call with timed argument.

```
#include<stdio.h>
#include<unistd.h>
#include<error.h>
#include<fcntl.h>
#include<sys/select.h>

char buff[1000];
int main( int arg, char *argv[])
{
    int fd1= open (argv[1], O_RDONLY);
    int  fd2= open (argv[2], O_RDONLY);

    int max,r,w;

    max=(fd1>fd2)? fd1:fd2;

    fd_set readset;
    FD_ZERO(&readset);

    FD_SET(fd1,&readset);
    FD_SET(fd2,&readset);

    struct timeval timeout;
    timeout.tv_sec = 5;
    timeout.tv_usec = 42;

    int n=select(max+1, &readset,NULL,NULL,&timeout);

    printf("no of files ready %d ", n);

    if(n==-1)
    {
        perror("Failed to open file for reading");
        return -1;
    }
}
```

```

if (FD_ISSET(fd1,&readset))
{

r=read(fd1, buff, sizeof(buff));
w=write(STDOUT_FILENO,buff, r);

if (r== -1 || w== -1)
{
perror("failed :");
}

}

if (FD_ISSET(fd2, &readset))

{
r=read(fd2, buff, sizeof(buff));
w=write(STDOUT_FILENO,buff,r);

if (r== -1 || w== -1)
{
perror("failed :");
}

}

close(fd1);
close(fd2);

return 0;
}

```

Output: -

```

no of files ready 2 muhammad@muhammad-VirtualBox:~/labs/cse302$ gcc lab7task4.c -o lab7task4
muhammad@muhammad-VirtualBox:~/labs/cse302$ ./lab7task4 file.txt file1.txt
file1
ali
khan
file2
ali
khan
1801
no of files ready 2 muhammad@muhammad-VirtualBox:~/labs/cse302$

```