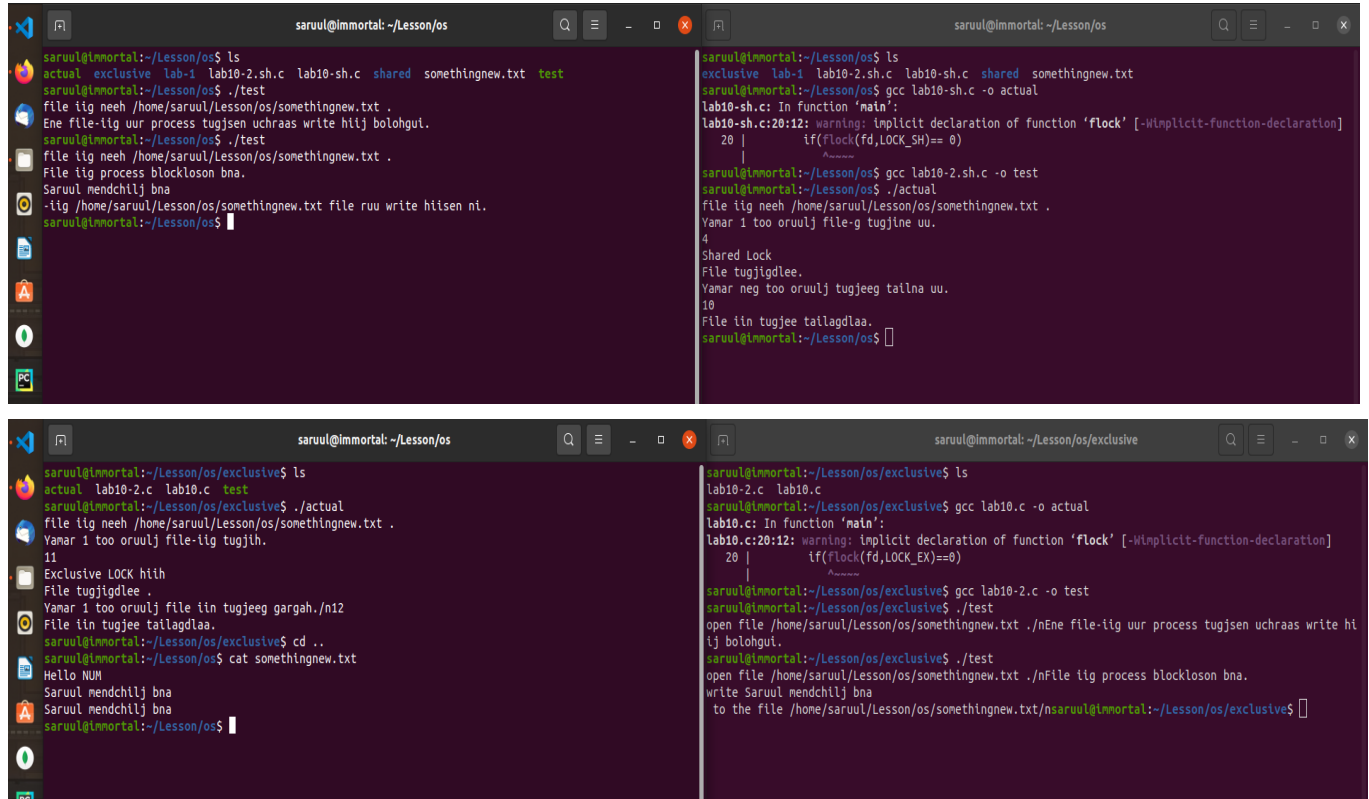


Үйлдлийн системийн онол  
Семинар 10: Файл цоожлох  
Г. Саруул 20В1NUM2095

1. Shared болон exclusive lock хийсэн нь



```
saruul@immortal: ~/Lesson/os
actual exclusive lab-1 lab10-2.sh.c lab10-sh.c shared somethingnew.txt test
saruul@immortal:~/Lesson/os$ ./test
file iig neeh /home/saruul/Lesson/os/somethingnew.txt .
Ene file-iig uur process tugjsen uchraas write hiij болохgui.
saruul@immortal:~/Lesson/os$ ./test
file iig neeh /home/saruul/Lesson/os/somethingnew.txt .
File iig process blocklosn bna.
Saruul mendchilj bna
-tig /home/saruul/Lesson/os/somethingnew.txt file ruu write hiisen ni.
saruul@immortal:~/Lesson/os$
```

```
saruul@immortal:~/Lesson/os$ ls
exclusive lab-1 lab10-2.sh.c lab10-sh.c shared somethingnew.txt
saruul@immortal:~/Lesson/os$ gcc lab10-sh.c -o actual
lab10-sh.c: In function 'main':
lab10-sh.c:20:12: warning: implicit declaration of function 'flock' [-Wimplicit-function-declaration]
   20 |         if(flock(fd,LOCK_SH)== 0)
       |            ^~~~~~
saruul@immortal:~/Lesson/os$ gcc lab10-2.sh.c -o test
saruul@immortal:~/Lesson/os$ ./actual
file iig neeh /home/saruul/Lesson/os/somethingnew.txt .
Yamar i too oruulj file-g tugjine uu.
4
Shared Lock
File tugjigdee.
Yamar neg too oruulj tugjeeg talina uu.
10
File iin tugjee tallagdlaa.
saruul@immortal:~/Lesson/os$
```

```
saruul@immortal:~/Lesson/os/exclusive$ ls
lab10-2.c lab10.c test
saruul@immortal:~/Lesson/os/exclusive$ ./actual
file iig neeh /home/saruul/Lesson/os/somethingnew.txt .
Yamar i too oruulj file-iig tugjih.
11
Exclusive LOCK hthh
File tugjigdee .
Yamar i too oruulj file iin tugjeeg gargah./n12
File iin tugjee tallagdlaa.
saruul@immortal:~/Lesson/os/exclusive$ cd ..
saruul@immortal:~/Lesson/os$ cat somethingnew.txt
Hello NUM
Saruul mendchilj bna
Saruul mendchilj bna
saruul@immortal:~/Lesson/os$
```

```
saruul@immortal:~/Lesson/os/exclusive$ ls
lab10-2.c lab10.c
saruul@immortal:~/Lesson/os/exclusive$ gcc lab10.c -o actual
lab10.c: In function 'main':
lab10.c:20:12: warning: implicit declaration of function 'flock' [-Wimplicit-function-declaration]
   20 |         if(flock(fd,LOCK_EX)==0)
       |            ^~~~~~
saruul@immortal:~/Lesson/os/exclusive$ gcc lab10-2.c -o test
saruul@immortal:~/Lesson/os/exclusive$ ./test
open file /home/saruul/Lesson/os/somethingnew.txt ./nEne file-iig uur process tugjsen uchraas write hi
ij болохgui.
saruul@immortal:~/Lesson/os/exclusive$ ./test
open file /home/saruul/Lesson/os/somethingnew.txt ./nFile iig process blocklosn bna.
write Saruul mendchilj bna
to the file /home/saruul/Lesson/os/somethingnew.txt/nSaruul@immortal:~/Lesson/os/exclusive$
```

Implementation дээр хэрвээ файлыг түгжээгүй бол somethingnew.txt файл руу “Saruul mendchilj bna” гэж оруулах ёстой. Файлаа түгжсэн эсэхээ шалгахын тулд эхлээд файлаа түгжээд тэр түгжсэн файлаа ахиж түгжих гэж шалгасан.

2. Файлыг таллан хувааж lock хийсэн нь

Lock хийхдээ file-ийн хэмжээний тал талаар нь хоёр lock хийнэ гэдгийг мэдэж байгаа ч гэсэн C дээр хийж чадсангүй.

```
import java.io.*;

import java.nio.channels.*;

public class LockingExample {

public static final boolean EXCLUSIVE = false;
```

```
public static final boolean SHARED = true;

public static void main(String args[]) throws IOException {

    FileLock sharedLock = null;

    FileLock exclusiveLock = null;

    try {

        RandomAccessFile raf = new RandomAccessFile("", "rw");

        FileChannel ch = raf.getChannel();

        exclusiveLock = ch.lock(0, raf.length() / 2, EXCLUSIVE);

        exclusiveLock.release();

        sharedLock = ch.lock(raf.length() / 2 + 1, raf.length(), SHARED);

        sharedLock.release();

    } catch (java.io.IOException ioe) {

        System.err.println(ioe);

    } finally {

        if (exclusiveLock != null)

            exclusiveLock.release();

        if (sharedLock != null)
```

```
        sharedLock.release();  
  
    }  
  
}
```

Хавсралт:

LOCK:

```
#include <stdio.h>  
#include <unistd.h>  
#include <sys/types.h>  
#include <sys/stat.h>  
#include <fcntl.h>  
#include <errno.h>  
  
int main()  
{  
    int fd,i;  
    char path[]="/home/saruul/Lesson/os/somethingnew.txt";  
    extern int errno;  
    fd=open(path,O_WRONLY|O_CREAT);  
    if(fd!=-1)  
    {  
        printf("file iig neeh %s .\n",path);  
        printf("Yamar 1 too oruulj file-iig tugjih. \n");  
        scanf("%d",&i);  
        printf("Exclusive LOCK hiih\n");  
        // SHAREDLOCK hiih бол LOCK_EX -> LOCK_SH болгоно.  
        if(flock(fd,LOCK_EX)==0)  
        {  
            printf("File tugjigdlee .\n");  
        }  
    }  
}
```

```

    }
    else
    {
        printf("File tugjigdsengui. \n");
    }

    printf("Yamar 1 too oruulj file iin tugjeeг gargah./\n");
    scanf("%d",&i);
    if(flock(fd,LOCK_UN)==0)
    {
        printf("File iin tugjee tailagdlaa. \n");
    }
    else
    {
        printf("File iin tugjee tailagdsangui. \n");
    }
    close(fd);

}
else
{
    printf("Ene file-iig neej chadahgui baina %s/\n",path);
}
}

```

## TEST:

```

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

int main()
{
    int fd,i;
    char path[]="/home/saruul/Lesson/os/somethingnew.txt";
    char s[]="Saruul mendchilj bna \n";
    extern int errno;
    fd=open(path,O_WRONLY|O_CREAT|O_APPEND);

```

```
if(fd!=-1)
{
    printf("open file %s ./n",path);

    if(flock(fd,LOCK_EX|LOCK_NB)==0)
    {
        printf("File iig process blockloson bna. \n");
        if(-1!=write(fd,s,sizeof(s)))
        {
            printf("%s-iig %s-file ruu bichsen ni. \n",s,path);
        }
        else
        {
            printf("Ene file-ruu bichij chadahgui bna %s/n",path);
        }
    }
    else
    {
        printf("Ene file-iig uur process tugjsen uchraas write hii j  
bolohgui. \n");
    }

    close(fd);

}

else
{
    printf("File iig neej chadahgui bna. %s\n",path);
}
}
```