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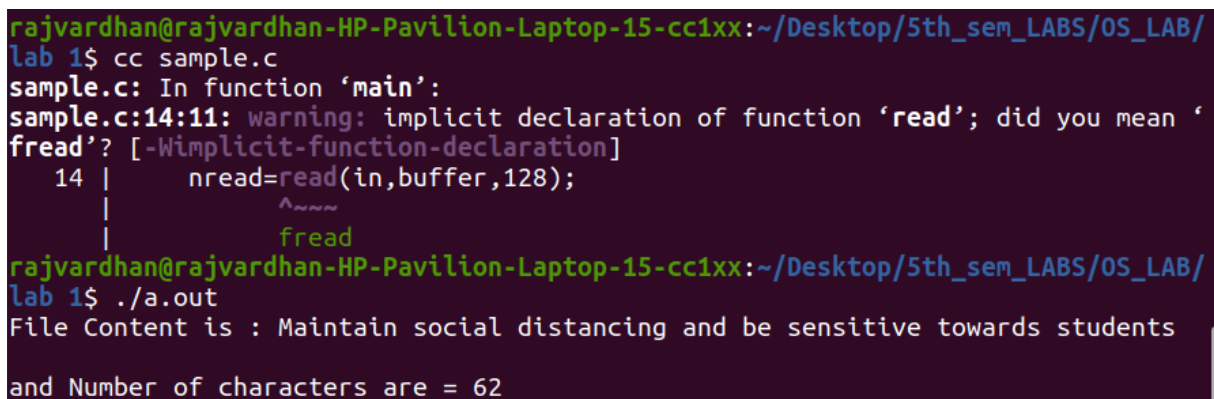
OS LAB – 1: Working with Regular Files

Sample program :

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

int main()
{
    char c;
    int in, out;
    char buffer[128];
    int nread;
    in=open("sample.txt",O_RDWR);
    nread=read(in,buffer,128);
    printf("File Content is : %s and Number of characters are = %d\n",buffer, nread);
    exit(0);
}
```

Output :



```
rajvardhan@rajvardhan-HP-Pavilion-Laptop-15-cc1xx:~/Desktop/5th_sem_LABS/OS_LAB/
lab 1$ cc sample.c
sample.c: In function 'main':
sample.c:14:11: warning: implicit declaration of function 'read'; did you mean '
fread'? [-Wimplicit-function-declaration]
   14 |         nread=read(in,buffer,128);
       |                ^
       |                fread
rajvardhan@rajvardhan-HP-Pavilion-Laptop-15-cc1xx:~/Desktop/5th_sem_LABS/OS_LAB/
lab 1$ ./a.out
File Content is : Maintain social distancing and be sensitive towards students
and Number of characters are = 62
```

P1) Write a program to print the lines of a file that contain a word given as the program argument (a simple version of grep UNIX utility)

program :

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

int main(int argc, char *argv[])
{
    int sfd,i=0,k=0;
    char ch[100],chr;

    if(argc!=3)
    {
        printf("Insufficient Arguments\n");
        exit(1);
    }

    if( (sfd=open(argv[2],O_RDONLY))===-1)
    {
        printf("File not found\n");
        exit(1);
    }

    // printf("File Contents=%s and Number of characters are=%d",buffer, nread);
    while((read(sfd,&chr,1))>0)
    {
        if(chr!='\n')
        {
            ch[i]=chr;
            i++;
        }

        else
        {
            k++;
            ch[i]='\0';
```

```

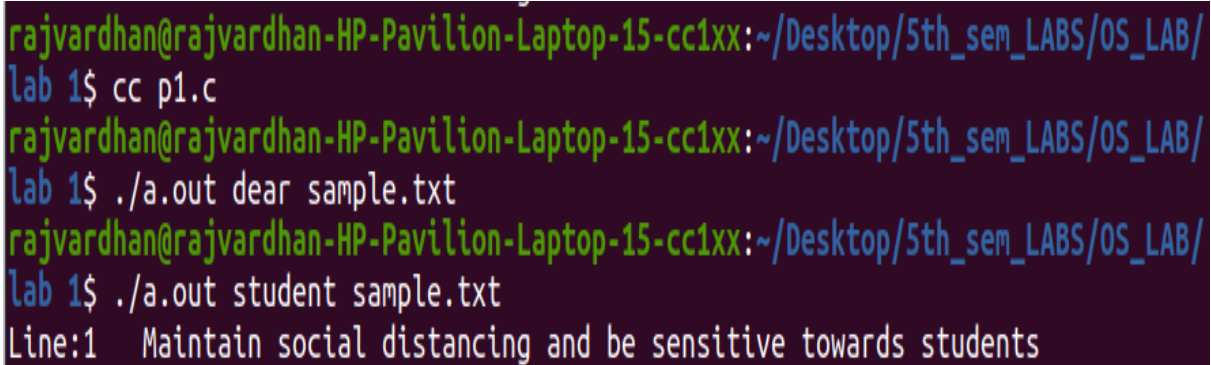
        i=0;
        if(strstr(ch,argv[1])!=NULL){
            printf("Line:%d \t %s \n", k,ch);
        }
    }
}

exit(0);

}

```

Output :



```

rajvardhan@rajvardhan-HP-Pavilion-Laptop-15-cc1xx:~/Desktop/5th_sem_LABS/OS_LAB/
lab 1$ cc p1.c
rajvardhan@rajvardhan-HP-Pavilion-Laptop-15-cc1xx:~/Desktop/5th_sem_LABS/OS_LAB/
lab 1$ ./a.out dear sample.txt
rajvardhan@rajvardhan-HP-Pavilion-Laptop-15-cc1xx:~/Desktop/5th_sem_LABS/OS_LAB/
lab 1$ ./a.out student sample.txt
Line:1  Maintain social distancing and be sensitive towards students

```

P2) Write a program to list the files given as arguments, stopping every 20 lines until a key is hit. (a simple version of more UNIX utility)

program :

```

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

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

    int sfd,sfd2,i=0,k=0,p=0;
    char ch[100],ch2[100],chr;

    if(argc!=3)
    {
        printf("Insufficient Arguments\n");
    }
}

```

```

    exit(1);
}

if( (sfd=open(argv[1],O_RDONLY))==-1)
{
    printf("File not found\n");
    exit(1);
}

// printf("File Contents=%s and Number of characters are=%d",buffer, nread);
while((read(sfd,&chr,1))>0)
{
    if(chr!='\n')
    {
        ch[i]=chr;
        i++;
    }

    else
    {
        k++;
        p++;
        ch[i]='\0';
        i=0;
        printf("Line:%d \t %s \n", p,ch);
        if(k==20)
        {
            fgetc(stdin);
            k=0;
        }
    }
}
close(sfd);

if( (sfd2=open(argv[2],O_RDONLY))==-1)
{
    printf("File not found\n");
    exit(1);
}

p=0;

while((read(sfd,&chr,1))>0)
{
    if(chr!='\n')
    {
        ch2[i]=chr;
        i++;
    }
}

```

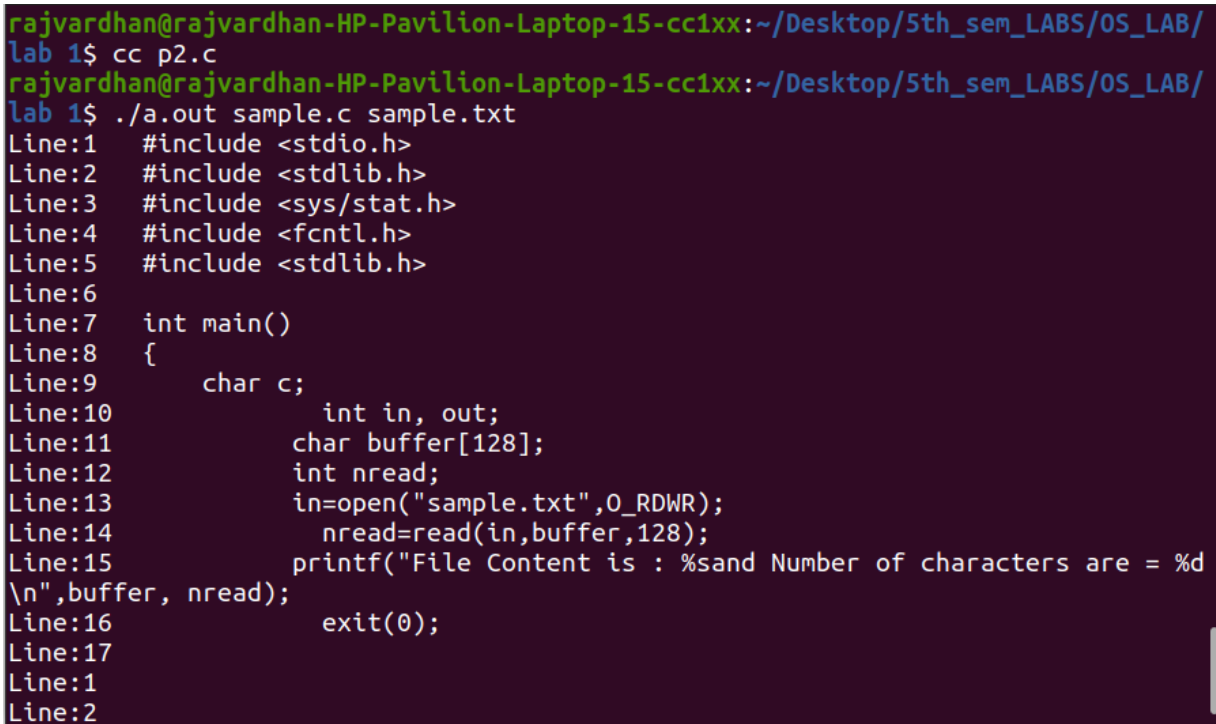
```

}

else
{
    k++;
    p++;
    ch[i]='\0';
    i=0;
    printf("Line:%d \t %s \n", p,ch2);
    if(k==20)
    {
        fgetc(stdin);
        k=0;
    }
}
}exit(0);
}

```

Output :



```

rajvardhan@rajvardhan-HP-Pavilion-Laptop-15-cc1xx:~/Desktop/5th_sem_LABS/OS_LAB/
lab 1$ cc p2.c
rajvardhan@rajvardhan-HP-Pavilion-Laptop-15-cc1xx:~/Desktop/5th_sem_LABS/OS_LAB/
lab 1$ ./a.out sample.c sample.txt
Line:1  #include <stdio.h>
Line:2  #include <stdlib.h>
Line:3  #include <sys/stat.h>
Line:4  #include <fcntl.h>
Line:5  #include <stdlib.h>
Line:6
Line:7  int main()
Line:8  {
Line:9      char c;
Line:10          int in, out;
Line:11          char buffer[128];
Line:12          int nread;
Line:13          in=open("sample.txt",O_RDWR);
Line:14          nread=read(in,buffer,128);
Line:15          printf("File Content is : %s and Number of characters are = %d
\n",buffer, nread);
Line:16          exit(0);
Line:17
Line:1
Line:2

```

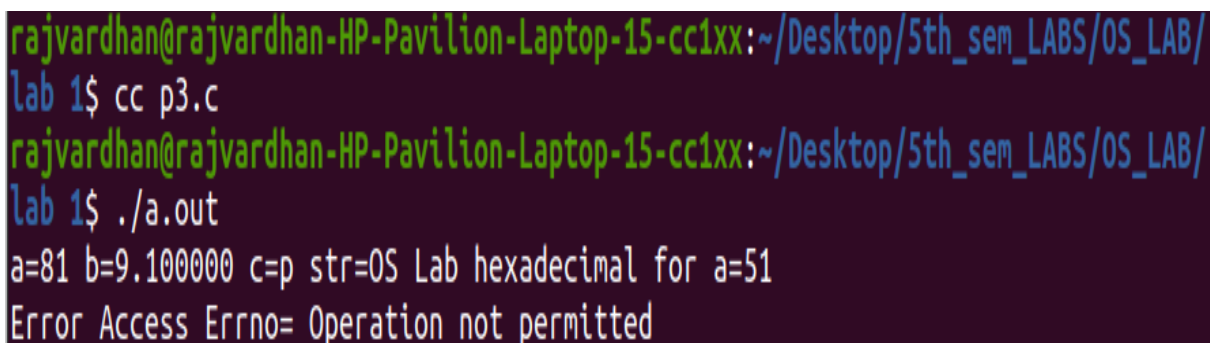
P3) Demonstrate the use of different conversion specifiers and resulting output to allow the items to be printed.

Program :

```
#include<stdio.h>
#include<stdlib.h>
#include<errno.h>
// extern int errno;

int main()
{
    int a=81;
    float b=9.1;
    char c='p';
    char str[]="OS Lab";
    printf("a=%d b=%f c=%c str=%s hexadecimal for a=%x \n",a,b,c,str,a);
    errno=EPERM;
    printf("Error Access Errno= %m\n");
}
```

Output :



```
rajvardhan@rajvardhan-HP-Pavilion-Laptop-15-cc1xx:~/Desktop/5th_sem_LABS/OS_LAB/
lab 1$ cc p3.c
rajvardhan@rajvardhan-HP-Pavilion-Laptop-15-cc1xx:~/Desktop/5th_sem_LABS/OS_LAB/
lab 1$ ./a.out
a=81 b=9.100000 c=p str=OS Lab hexadecimal for a=51
Error Access Errno= Operation not permitted
```

P4) Write a program to copy character-by character copy is accomplished using calls to the functions referenced in stdio.h.

program :

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

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

    char c;
    int in,out;
```

```

char buffer[128];
int nread;

if(argc!=3)
{
    printf("Insufficient Arguments\n");
    exit(1);
}

in=open(argv[1],O_RDWR);
out=open(argv[2],O_WRONLY|O_CREAT, S_IRUSR|S_IWUSR);

if( in==-1 || out==-1)
{
    printf("File not found\n");
    exit(1);
}

while(read(in,&c,1) == 1)
{
    write(out,&c,1);
}

printf("Contents of file copied\n");
exit(0);
}

```

Output :

```

rajvardhan@rajvardhan-HP-Pavilion-Laptop-15-cc1xx:~/Desktop/5th_sem_LABS/OS_LAB
/lab $ cat random.txt
cat: random.txt: No such file or directory
rajvardhan@rajvardhan-HP-Pavilion-Laptop-15-cc1xx:~/Desktop/5th_sem_LABS/OS_LAB
/lab $ cc p4.c
rajvardhan@rajvardhan-HP-Pavilion-Laptop-15-cc1xx:~/Desktop/5th_sem_LABS/OS_LAB
/lab $ ./a.out sample.txt random.txt
Contents of file copied
rajvardhan@rajvardhan-HP-Pavilion-Laptop-15-cc1xx:~/Desktop/5th_sem_LABS/OS_LAB
/lab $ cat random.txt
Maintain social distancing and be sensitive towards students

India reported 53,256 new cases in the last 24 hours, lowest single-day spike s
ince April 24. With this, the country's total coronavirus caseload has has reac
hed 29,935,221. The country reported 1,422 deaths yesterday (lowest single-day
spike in deaths since April 17), taking the death toll to 388,135. Marking the
seventh International Yoga Day, Prime Minister Narendra Modi today said yoga he
lped Covid patients recover faster. Yoga remains a ray of hope when world fight
s Covid pandemic, the prime minister said.

Kerala reported 11,647 new infections, followed by Maharashtra (9,361), Tamil N
adu (7,817), Andhra Pradesh (5,646), Karnataka (4,517), Delhi (124) and West Be
ngal (2,184).

```