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OS LAB – 1: <u>Working with Regular Files</u>
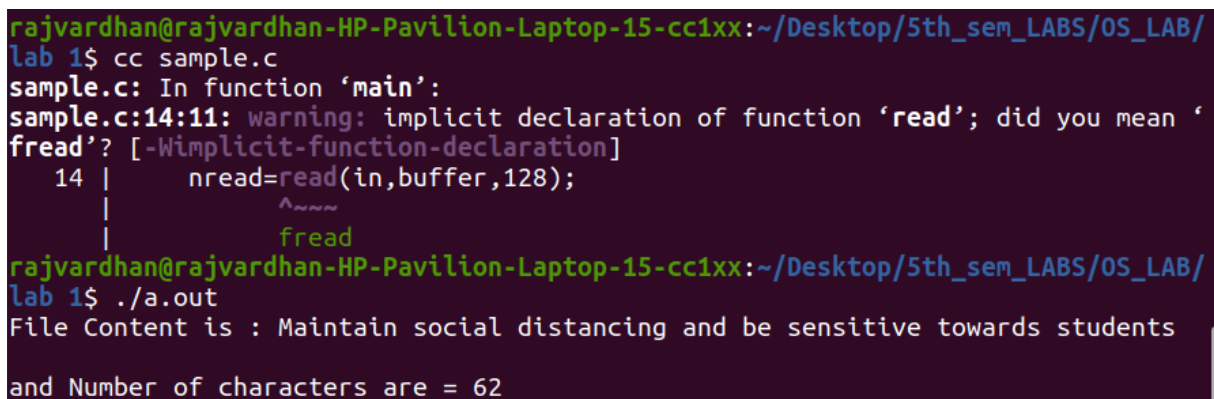
<u>Sample program :</u>

```
#include <stdio.h>
#include <stdlib.h>
#include <sys/stat.h>
#include <fcntl.h>
#include <stdlib.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 : %sand Number of characters are = %d\n",buffer, nread);
   exit(0);
 }
```

<u>Output :</u>

```
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 :

```c
#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';
```
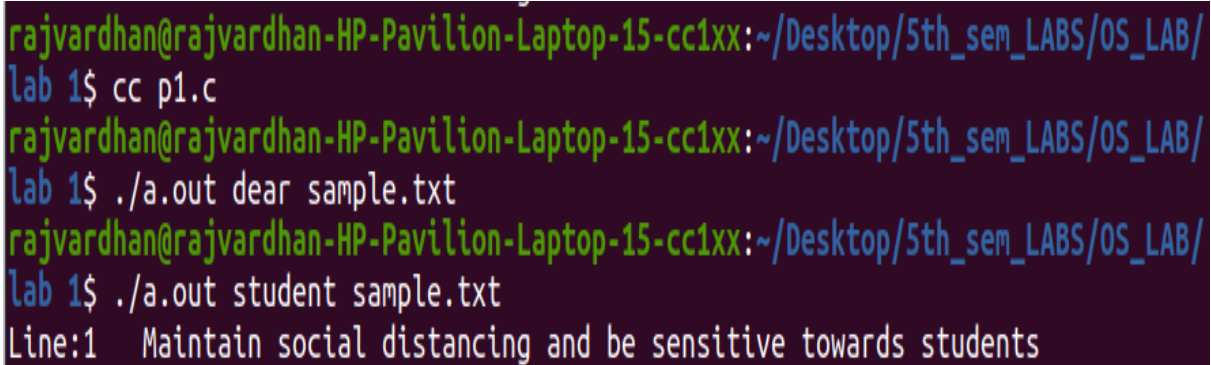
```c
        i=0;
        if(strstr(ch,argv[1])!=NULL){
            printf("Line:%d \t %s \n", k,ch);
        }
    }
}

    exit(0);

}
```

Output :

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 :

```c
#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");
```

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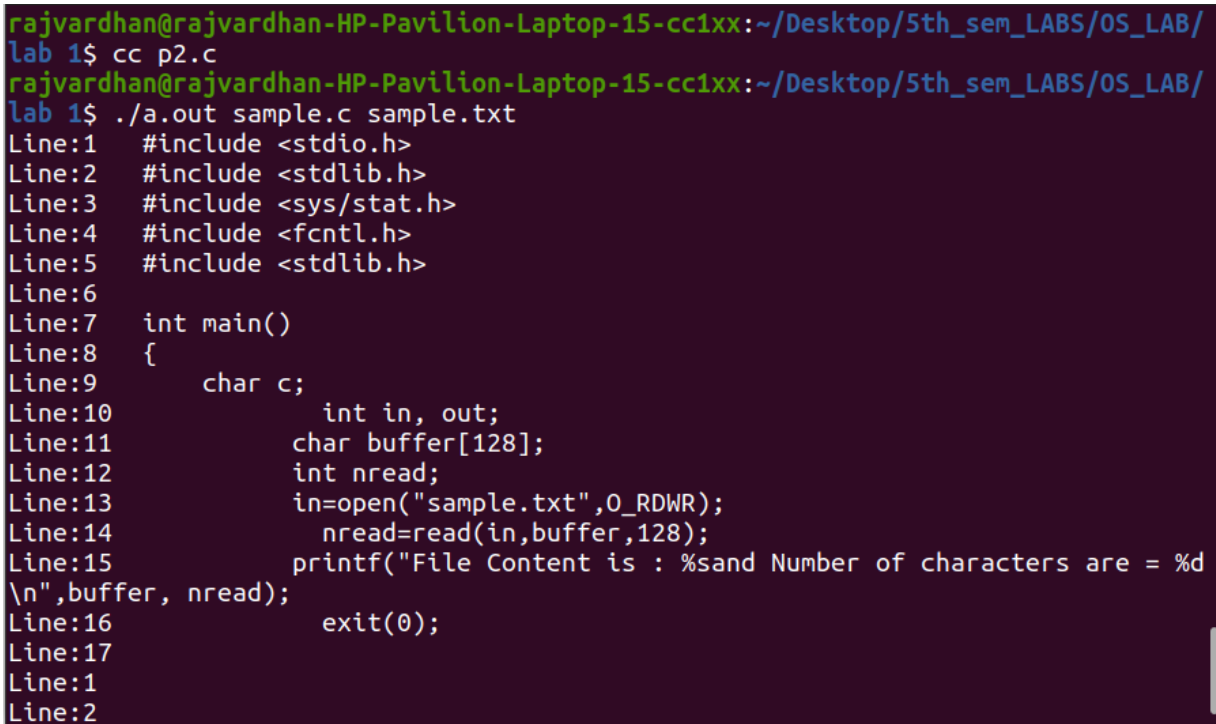
```c
        }
    else
    {
        k++;
        p++;
        ch[i]='\0';
        i=0;
        printf("Line:%d \t %s \n", p,ch2);
        if(k==20)
      {
          fgetc(stdin);
          k=0;
      }
       }
    }exit(0);
}
```

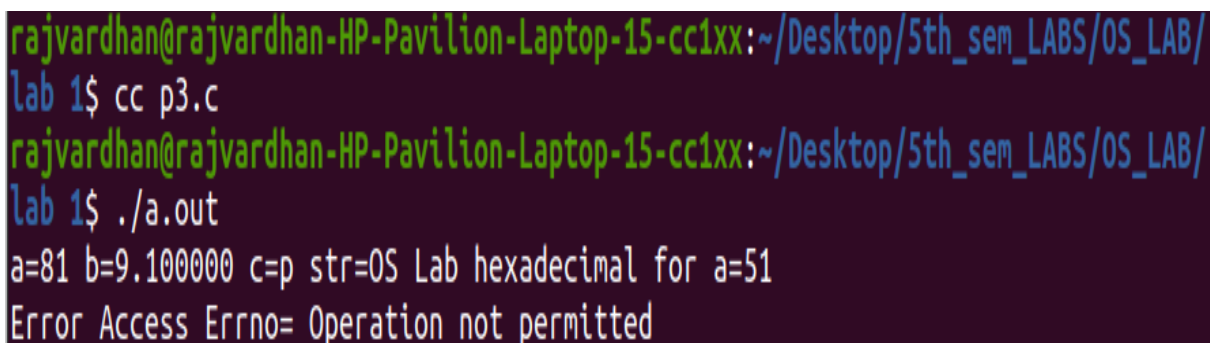**Output :**

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

Program :

```c
#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 :

```c
#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;
```

```c
    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 :