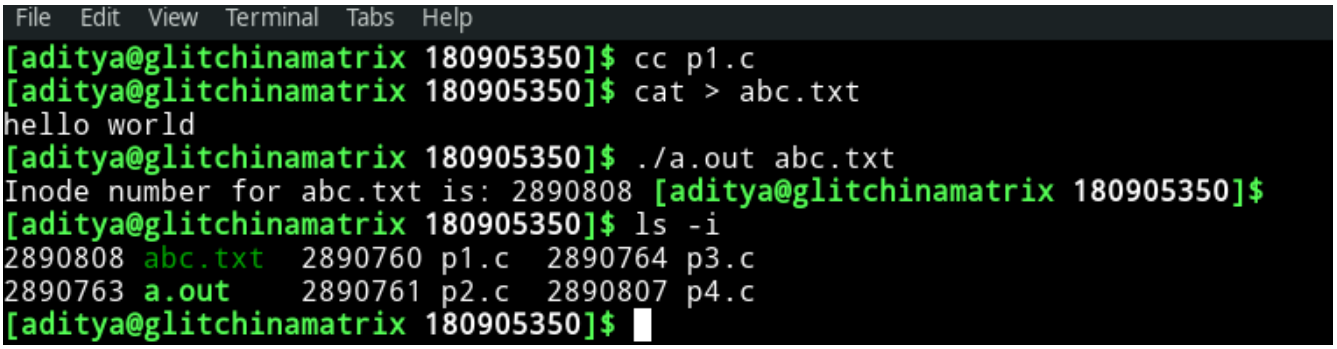
Aditya Pradhan OS Lab 4 180905350 CSE D

Q1)
code

```
#include <sys/types.h>
#include <sys/stat.h>
#include <unistd.h>
#include <stdio.h>
int main (int argc, char *argv[])
{
struct stat sb;
int ret;
if (argc < 2) {
fprintf (stderr, "usage: %s <file>\n", argv[0]);
return 1;
}
ret = stat (argv[1], &sb);
if (ret) {
perror ("stat");
return 1;
}


printf ("Inode number for %s is: %ld ", argv[1], sb.st_ino);
return 0;
}
```

Output



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Q2)
Code

```
#include <sys/types.h>
#include <sys/stat.h>
#include <unistd.h>
#include <stdio.h>
#include <time.h>
#include <stdlib.h>
#include<dirent.h>
#include<string.h>
char* formatdate(char* str, time_t val)
{
strftime(str, 36, "%d.%m.%Y %H:%M:%S", localtime(&val));
return str;
}
int main(int argc, char *argv[]) {
struct stat sb;
if(argc < 2) {
printf("Insufficient arguments!\n");
return 1;
}
int ret;
char date[36];
 ret = stat(argv[1], &sb);
if(ret) {
perror("stat");
return 1;
}
printf("ID of device - %d\n", sb.st_dev);
printf("INO Number is - %llu\n", sb.st_ino);
printf("File mode - %hu\n", sb.st_mode);
printf("Number of hard links - %d\n", sb.st_nlink);
printf("User ID - %d\n", sb.st_uid);
printf("Group owner - %d\n", sb.st_gid);
printf("File size - %lld\n", sb.st_size);
printf("Blocksize - %d\n", sb.st_blksize);
printf("Number of Blocks - %lld\n", sb.st_blocks);
printf("Last access time - %s\n", formatdate(date,sb.st_atime));
printf("Last modification time - %s\n", formatdate(date,sb.st_mtime));
printf("Last change time - %s\n", formatdate(date,sb.st_ctime));
 DIR * dp;
    struct dirent * entry;
    struct stat statbuf;
    if((dp = opendir(".")) == NULL) {
        printf("Cannot open directory \n");
        return 0;
        }
```

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```
    chdir(".");
    while((entry = readdir(dp)) != NULL){
        lstat(entry->d_name,&statbuf);
        if(!S_ISDIR(statbuf.st_mode)){
            if(strcmp(entry->d_name,argv[1])==0){
                    printf("Permissions\t");
                    printf( (S_ISDIR(statbuf.st_mode)) ? "d" : "-");
                    printf( (statbuf.st_mode & S_IRUSR) ? "r" : "-");
                    printf( (statbuf.st_mode & S_IWUSR) ? "w" : "-");
                    printf( (statbuf.st_mode & S_IXUSR) ? "x" : "-");
                    printf( (statbuf.st_mode & S_IRGRP) ? "r" : "-");
                    printf( (statbuf.st_mode & S_IWGRP) ? "w" : "-");
                    printf( (statbuf.st_mode & S_IXGRP) ? "x" : "-");
                    printf( (statbuf.st_mode & S_IROTH) ? "r" : "-");
                    printf( (statbuf.st_mode & S_IWOTH) ? "w" : "-");
                    printf( (statbuf.st_mode & S_IXOTH) ? "x" : "-");
                    printf("\n\n");
                   }
        }
    }
}
```

Output

```
File  Edit  View  Terminal  Tabs  Help
[aditya@glitchinamatrix 180905350]$ cc p2.c
[aditya@glitchinamatrix 180905350]$ ./a.out abc.txt
ID of device - 2055
INO Number is - 2890808
File mode - 33188
Number of hard links - 1
User ID - 1000
Group owner - 1000
File size - 12
Blocksize - 4096
Number of Blocks - 8
Last access time - 10.12.2020 17:35:26
Last modification time - 10.12.2020 17:35:32
Last change time - 10.12.2020 17:35:32
Permissions     -rw-r--r--

[aditya@glitchinamatrix 180905350]$
```

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Q3)
Code

```
#include<sys/types.h>
#include<sys/stat.h>
#include<unistd.h>
#include<stdio.h>
#include <inttypes.h>
#include<stdlib.h>
void main(int argc, char* argv[])
{
   if(argc<2)
   {
      printf("Insufficient arguments\n");
      return;
   }
   char new_path[100]="random.txt";
   struct stat start;
   int ret1 = stat(argv[1],&start);
   printf("Number of hard links:%ld\n", start.st_nlink);
   system("ls");
   printf("Linking..\n");
   int ret2 = link(argv[1],new_path);
   struct stat intermediate;
   int ret3 = stat(argv[1],&intermediate);
   printf("Number of hard links:%ld\n", intermediate.st_nlink);
   printf("New path:%s\n",new_path);
   system("ls");
   int ret4 = unlink(argv[1]);
   struct stat ending;
   int ret5 = stat(new_path,&ending);
   printf("Unlinking...\n");
   printf("Number of hard links after unlinking:%ld\n", ending.st_nlink);
   system("ls");
}
```

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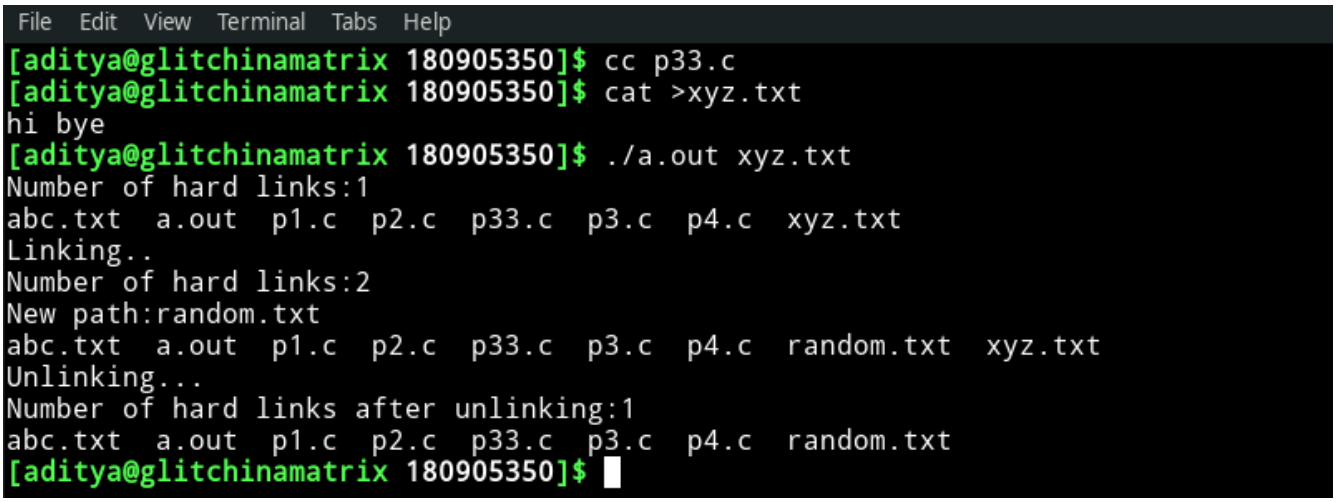
Output



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Q4)

```
#include<sys/types.h>
#include<sys/stat.h>
#include<unistd.h>
#include<stdio.h>
#include <inttypes.h>
#include<stdlib.h>
void main(int argc, char* argv[])
{
   if(argc<2)
   {
      printf("Insufficient arguments\n");
      return;
   }
   char new_path[100]="random2.txt";
   struct stat start;
   int ret1 = stat(argv[1],&start);
   system("ls");
   printf("Linking..\n");
   int ret2 = symlink(argv[1],new_path);
   struct stat intermediate;
   int ret3 = stat(argv[1],&intermediate);
   printf("New path:%s\n",new_path);
   system("ls");
   int ret4 = unlink(argv[1]);
   struct stat ending;
   int ret5 = stat(new_path,&ending);
   printf("Unlinking...\n");
   system("ls");
}
```

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Output