Assignment No. 7

a) Write a C Program that makes a copy of a file using standard I/O and system calls.

```
#include <stdio.h>
#include <stdlib.h>

int main(int argc, char *argv[]) {
    if (argc != 3) {
        printf("Usage: %s <source_file>
<destination_file>\n", argv[0]);
        return 1;
    }

    FILE *source = fopen(argv[1], "rb");
    if (!source) {
        perror("Source file");
        return 1;
    }

    FILE *destination = fopen(argv[2], "wb");
    if (!destination) {
        perror("Destination file");
        fclose(source);
        return 1;
    }

    char buffer[1024];
    size_t bytes_read;

    while ((bytes_read = fread(buffer, 1,
sizeof(buffer), source)) > 0) {
        fwrite(buffer, 1, bytes_read, destination);
    }

    fclose(source);
    fclose(destination);

    printf("File copied successfully.\n");
    return 0;
}
```

```
anubhav@DESKTOP-9VIA8NE:~/anubhav_oslab$ vim 7thAssigna.c
anubhav@DESKTOP-9VIA8NE:~/anubhav_oslab$ gcc 7thAssigna.c
anubhav@DESKTOP-9VIA8NE:~/anubhav_oslab$ ./a.out source.txt destination.txt
File copied successfully.
anubhav@DESKTOP-9VIA8NE:~/anubhav_oslab$ cat destination.txt
anubhav_oslab/manager.txt
anubhav@DESKTOP-9VIA8NE:~/anubhav_oslab$
```

b) Write in C the following Unix commands using system calls

i) cat

```
#include <stdio.h>
#include <stdlib.h>
int main(int argc, char *argv[]) {
    if (argc != 2) {
        fprintf(stderr, "Usage: %s <filename>\n",
argv[0]);
        exit(EXIT_FAILURE);
    }

    FILE *file = fopen(argv[1], "r");
    if (file == NULL) {
        perror("Error opening file");
        exit(EXIT_FAILURE);
    }
    char ch;
    while ((ch = fgetc(file)) != EOF) {
        putchar(ch);
    }
    fclose(file);
    return 0;
}
```

```
anubhav@DESKTOP-9VIA8NE:~/anubhav_oslab$ vim 7thAssignbi.c
anubhav@DESKTOP-9VIA8NE:~/anubhav_oslab$ gcc -o my_cat 7thAssignbi.c
anubhav@DESKTOP-9VIA8NE:~/anubhav_oslab$ ./my_cat trace.txt
+ 1.84375 0 2 cbr 210 ------  0 0.0 3.1 225 610
- 1.84375 0 2 cbr 210 ------  0 0.0 3.1 225 610
r 1.84471 2 1 cbr 210 ------  1 3.0 1.0 195 600
r 1.84566 2 0 ack 40  ------  2 3.2 0.1 82  602
+ 1.84566 0 2 tcp 1000 ------ 2 0.1 3.2 102 611
- 1.84566 0 2 tcp 1000 ------ 2 0.1 3.2 102 611
r 1.84609 2 3 cbr 210 ------- 0 0.0 3.1 225 610
+ 1.84609 2 3 cbr 210 ------- 0 0.0 3.1 225 610
d 1.84609 2 3 cbr 210 ------- 0 0.0 3.1 225 610
- 1.8461 2 3 cbr 210 ------- 0 0.0 3.1 192 511
r 1.84612 3 2 cbr 210 ------- 1 3.0 1.0 196 603
+ 1.84612 2 1 cbr 210 ------- 1 3.0 1.0 196 603
- 1.84612 2 1 cbr 210 ------- 1 3.0 1.0 196 603
+ 1.84625 3 2 cbr 210 ------- 1 3.0 1.0 196 612
anubhav@DESKTOP-9VIA8NE:~/anubhav_oslab$
```

ii) cp

```
#include <stdio.h>
#include <stdlib.h>

int main(int argc, char *argv[]) {
    if (argc != 3) {
        fprintf(stderr, "Usage: %s <source_file>
<destination_file>\n", argv[0]);
        exit(EXIT_FAILURE);
    }

    FILE *source = fopen(argv[1], "rb");
    if (source == NULL) {
        perror("Error opening source file");
        exit(EXIT_FAILURE);
    }

    FILE *destination = fopen(argv[2], "wb");
    if (destination == NULL) {
        perror("Error opening destination file");
        fclose(source);
        exit(EXIT_FAILURE);
    }

    char ch;
    while ((ch = fgetc(source)) != EOF) {
        fputc(ch, destination);
    }

    fclose(source);
    fclose(destination);
    return 0;
}
```

```
anubhav@DESKTOP-9VIA8NE:~/anubhav_oslab$ vim 7thAssignbii.c
anubhav@DESKTOP-9VIA8NE:~/anubhav_oslab$ gcc -o my_cp 7thAssignbii.c
anubhav@DESKTOP-9VIA8NE:~/anubhav_oslab$ ./my_cp newemp.txt newfile.txt
anubhav@DESKTOP-9VIA8NE:~/anubhav_oslab$ cat newfile.txt
clerk.txt:7900 JAMES CLERK 7698 3-DEC-1981 950 30
manager.txt:7566 JONES MANAGER 7839 2-APR-1981 2975 20
manager.txt:7698 BLAKE MANAGER 7839 1-MAY-1981 2850 30
manager.txt:7782 CLARK MANAGER 7839 9-JUN-1981 2450 10
clerk.txt:7876 ADAMS CLERK 7788 12-JAN-1983 1100 20
clerk.txt:7934 MILLER CLERK 7782 23-JAN-1982 1300 10
anubhav@DESKTOP-9VIA8NE:~/anubhav_oslab$
```

c) Write a C program to list files in a directory

```
#include <stdio.h>
#include <stdlib.h>
#include <dirent.h>

int main(int argc, char *argv[]) {
    if (argc != 2) {
        printf("Usage: %s <directory>\n", argv[0]);
        return 1;
    }

    DIR *dir = opendir(argv[1]);
    if (!dir) {
        perror("opendir");
        return 1;
    }

    struct dirent *entry;
    while ((entry = readdir(dir)) != NULL) {
        printf("%s\n", entry->d_name);
    }

    closedir(dir);
    return 0;
}
```

```
anubhav@DESKTOP-9VIA8NE:~/anubhav_oslab$ vim
7thAssignc.c
anubhav@DESKTOP-9VIA8NE:~/anubhav_oslab$ gcc -o
7thAssignc 7thAssignc.c
anubhav@DESKTOP-9VIA8NE:~/anubhav_oslab$ ./7thAssignc
.
3rdassignfile.txt
trace.txt
3rdAssignb.sh
7thAssignc.c
4thassigna.sh
manager.txt
\
7thAssignc
c_progams
clerk.txt
5thassigna.sh
```

```
5thassignb.sh
5thassignc.sh
4thassignb.sh
4thassignd.sh
first.c
7thAssignbi.c
source.txt
my_cat
newfile.txt
newemp.txt
e.awk
employee.txt
a.out
3rdAssignd.sh
7thAssignbii.c
my_cp
..
filter_1981.awk
```

d) Write a C program to list for every file in a directory, its inode number and file name.

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

int main(int argc, char *argv[]) {
    if (argc != 2) {
        printf("Usage: %s <directory>\n", argv[0]);
        return 1;
    }

    DIR *dir = opendir(argv[1]);
    if (!dir) {
        perror("opendir");
        return 1;
    }

    struct dirent *entry;
    while ((entry = readdir(dir)) != NULL) {
        char filepath[1024];
```

```
        snprintf(filepath, sizeof(filepath), "%s/%s",
argv[1], entry->d_name);

        struct stat st;
        if (stat(filepath, &st) == 0) {
            printf("Inode: %ld, File: %s\n",
st.st_ino, entry->d_name);
        }
    }

    closedir(dir);
    return 0;
}

anubhav@DESKTOP-9VIA8NE:~/anubhav_oslab$ vim
7thAssignd.c
anubhav@DESKTOP-9VIA8NE:~/anubhav_oslab$ gcc -o
7thAssignd 7thAssignd.c
anubhav@DESKTOP-9VIA8NE:~/anubhav_oslab$ ./7thAssignd
.
Inode: 29412, File: 3rdassignfile.txt
Inode: 29457, File: trace.txt
Inode: 29456, File: 3rdAssignb.sh
Inode: 6077, File: 7thAssignc.c
Inode: 29413, File: 4thassigna.sh
Inode: 29428, File: manager.txt
Inode: 29430, File: \
Inode: 6088, File: 7thAssignc
Inode: 29453, File: c_progams
Inode: 29422, File: clerk.txt
Inode: 6082, File: 7thAssignd.c
Inode: 29419, File: 5thassigna.sh
Inode: 29420, File: 5thassignb.sh
Inode: 29421, File: 5thassignc.sh
Inode: 29415, File: 4thassignb.sh
Inode: 29418, File: 4thassignd.sh
Inode: 29427, File: first.c
Inode: 6071, File: 7thAssignbi.c
Inode: 6046, File: source.txt
Inode: 6083, File: my_cat
```