CS5243 Advanced UNIX Programming
Assignment 2 (4 pts)
Group 4

Screenshot of codes:

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

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

    char c; // buffer to store the char ready to read and write
    int read_sit; // read situation, which is the return value from
    read()

    // argv[0] is the exec file name
    int ref_fd = open(argv[1], O_RDONLY);
    int tar_fd = open(argv[2], O_TRUNC | O_RDWR | O_CREAT);

    struct stat info; // for storing the file mode
    stat(argv[1], &info); // get ref file mode
    // printf("Permissions are: %08x\n", info.st_mode);
    chmod(argv[2], info.st_mode); // change tar file mode
    // stat(argv[2], &info);
    // printf("Permissions are: %08x\n", info.st_mode);

    lseek(ref_fd, 0, SEEK_SET); // move cursor (ref file) to first
    lseek(tar_fd, 0, SEEK_SET); // move cursor (ref file) to first

    read_sit = read(ref_fd, &c, 1);
    while(read_sit!=0){
        write(tar_fd, &c, 1);
        // printf("%c", c);
        read_sit = read(ref_fd, &c, 1);
    }

    close(ref_fd);
    close(tar_fd);
}
```

Screenshot of result:


```
freebsd@generic:~/Advanced-UNIX-Programming_Student/assignment2 % make clean && make
rm -f assignment2.o assignment2
gcc  -O2 -pipe -c assignment2.c -o assignment2.o
gcc -std=c11 -O2 -Wall -o assignment2 assignment2.o
freebsd@generic:~/Advanced-UNIX-Programming_Student/assignment2 % ./assignment2 source.txt de
st.txt
freebsd@generic:~/Advanced-UNIX-Programming_Student/assignment2 % ls -l
total 148
-rw-r--r--  1 freebsd  freebsd     244 Apr 12 03:38 Makefile
-rwxr-xr-x  1 freebsd  freebsd   16288 Apr 12 03:41 assignment2
-rw-r--r--  1 freebsd  freebsd    1109 Apr 12 03:38 assignment2.c
-rw-r--r--  1 freebsd  freebsd    2120 Apr 12 03:41 assignment2.o
-rw-r--r--  1 freebsd  freebsd  112571 Apr 12 03:38 assignment2.pdf
-rw-r--r--  1 freebsd  freebsd     899 Apr 12 03:41 dest.txt
-rw-r--r--  1 freebsd  freebsd     899 Apr  8 16:28 source.txt
freebsd@generic:~/Advanced-UNIX-Programming_Student/assignment2 % diff source.txt dest.txt
freebsd@generic:~/Advanced-UNIX-Programming_Student/assignment2 %
```

1.

In order to open a file, we use int tar_fd = open(argv[2], O_TRUNC | O_RDWR | O_CREAT); to create a new file if it doesn't exist. And open the file in writing mode.

2.

In order to implement our cp function, we use the while loop to copy the file. In each iteration, the program reads a character from the source file, and then the program writes the same character in the destination file. While the source file cursor points to EOF, the program jumps out of the loop and closes both files.

The result of "diff" command shows that our program can copy the file correctly.