

Assignment 4

Student name: Kuo Han

Student#: 110039034

The whole process can be divided into two parts.

The first part determines the rows and columns of information that the picture contains and the number of characters that describe the picture.

The second part begins by copying exactly the information describing the image into the new file. Then, the information from the original image is read and written to the second file from the last line to the fourth line (Because the information saved in the first three lines was already written at the beginning of Part 2).

All the procedures use just one array: buffer[]

Original Picture:



The code is saved in file of reversePicture.c.

Below is the process of compiling and running this file.

```
(kali@kali)-[~/Programs]
$ gcc reversePicture.c -o a.out -lm

(kali@kali)-[~/Programs]
$ ./a.out m1.pgm m2.pgm
The number of lines of the picture: 512
The number of columns of the picture: 512
The up-and-down image has been saved to: m2.pgm
```

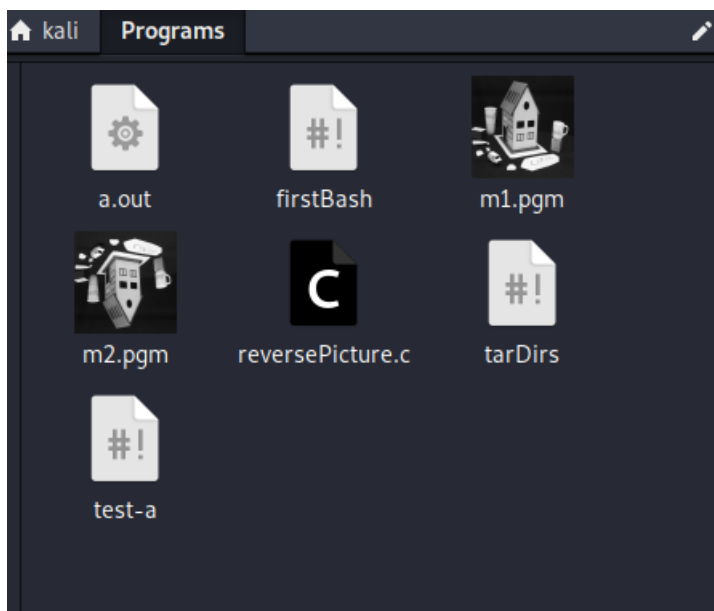
Result:



P.S.

m2.pgm is the upside down picture.

reversePicture.c , m1.pgm and m2.pgm are stored in same folder.



Appendix:

The code is stored in the reversepicture.c file. Same as the code below.

```
#include<stdio.h>
#include<unistd.h>
#include<fcntl.h>
#include<math.h>

#include<string.h>
#include<stdlib.h>

#define MAXSIZE 1024

/* the name of original picture saved in argv[1]
   The file name after the scroll down is saved in argv[2]*/
//Kuo Han was compiled on November 4, 2021

int main(int argc, char *argv[])
{
    int fd1,fd2;
    char buffer[MAXSIZE];          //use for save data
    int nbLines, nbCols;

    FILE *fp;
    int threelinelen = 0; //how many characters the first three rows have
    int bufferlen = 0;

    /*use function fgets() get the first three rows and calculate how many characters they
    have*/
    if((fp=fopen(argv[1],"rb"))==NULL){
        printf("this file cannot open\n");
        exit(1);
    }

    for(int i = 1; i<=3; i++)
    {
        int len = 0;
        if(fgets(buffer,MAXSIZE,fp)!=NULL)
        {
            len = strlen(buffer);
        }
        threelinelen = threelinelen + len;

        if(i==2)          //The rows and columns of the image are saved in the second row
        {
            sscanf(buffer,"%d %d",&nbLines,&nbCols);
            printf("The number of lines of the picture: %d\n", nbLines);
        }
    }
}
```

```

        printf("The number of columns of the picture: %d\n", nbCols);
    }
}
fclose(fp);

/*Open two files for read() and write() operations*/
if((fd1 = open(argv[1], O_RDONLY)) == -1 || ((fd2 = open(argv[2],
O_CREAT|O_WRONLY|O_TRUNC, 0700)) == -1))
{
    perror("file problem ");
    exit(2);
}

read(fd1,buffer,threelinelen);          //Read the information about the picture from
the m1.pgm file and write it to m2.pgm
write(fd2, buffer, threelinelen);

lseek(fd1,threelinelen, SEEK_SET);      // the pointer is set to end of 3rd line and
read() will start from 4th line
for(int i = nbLines - 1; i>=0 ;i--)    //Read from the last line of m1.pgm and write the
read data to m2.pgm
{
    lseek(fd1,threelinelen+i*nbCols,SEEK_SET);

    read(fd1, buffer, nbCols);

    bufferlen=strlen(buffer);

    lseek(fd2,0, SEEK_END);
    write(fd2, buffer, bufferlen);
}
close(fd1);
close(fd2);

printf("The up-and-down image has been saved to: %s\n", argv[2]);
exit(0);
}//

```