1)Problem 1

Makefile.mk

```
a.exe: client.o server.o
    gcc -o a.exe client.o server.o
client.o : client.c server.h
    gcc -c client.c
server.o : server.c server.h
    gcc -c server.c

```

Server.c

```c
#include<stdio.h>
#include "server.h"
void read(int *a,int n)
{
    printf("Enter the array elements:\n");
    for(int i=0;i<n;i++)
    scanf("%d",&*(a+i));
}
void display(int *a,int n)
{
    for(int i=0;i<n;i++)
    printf("%d ",*(a+i));
    printf("\n");
}
void sort(int *a,int n)//insertion sort
{
        int i,j,min,temp;
        for(i=0;i<n-1;i++)
        {
            min=i;
            for(j=i+1;j<n;j++)
            {
                if(*(a+j)<*(a+min))
                {
                    min=j;
                }
            }
            if(min!=i)
            {
                temp=*(a+i);
                *(a+i)=*(a+min);
                *(a+min)=temp;
            }
        }
}
```

Client.c

```c
#include<stdio.h>
#include<stdlib.h>
#include "server.h"
int main()
{
    int *a,n;
    printf("Enter size of array:");
    scanf("%d",&n);
    a=(int *)malloc(n*sizeof(int));
    if(a==NULL)
    {
        printf("MEMORY ALLOCATION ERROR!\n");
    }
    else{
    read(a,n);
    printf("Before Sorting:\n");
    display(a,n);
    sort(a,n);
    printf("After Sorting:\n");
    display(a,n);
    }
    free(a);
    return 0;
}
```

Server.h

```
1
2   void read(int *a,int n);
3
4   void display(int *a,int n);
5
6   void sort(int *a,int n);
```

Output

```
Select Command Prompt

C:\cs lab\week 15\w15_1>make
gcc -c server.c
gcc -o a.exe client.o server.o

C:\cs lab\week 15\w15_1>a
Enter size of array:5
Enter the array elements:
25 65 12 0 5
Before Sorting:
25 65 12 0 5
After Sorting:
0 5 12 25 65

C:\cs lab\week 15\w15_1>a
Enter size of array:5
Enter the array elements:
-2
-5
0
0
1
Before Sorting:
-2 -5 0 0 1
After Sorting:
-5 -2 0 1 6

C:\cs lab\week 15\w15_1>a
Enter size of array:5
Enter the array elements:
1
1
2
0
1
Before Sorting:
1 1 2 0 1
After Sorting:
0 1 1 1 2

C:\cs lab\week 15\w15_1>
```

2)Problem 2

```c
#include<stdio.h>
int main()
{
    FILE *fp1,*fp2,*fp3,*fp4;
    char f1[100],f2[100],f3[100];
    char ch;
    printf("Enter the name of first file:");
    scanf("%s",f1);
    printf("Enter the name of second file:");
    scanf("%s",f2);
    fp1=fopen(f1,"r");
    fp2=fopen(f2,"r");
    printf("Enter the file name where the contents of %s and %s to be copied:",f1,f2);
    scanf("%s",f3);
    fp3=fopen(f3,"w");
    fp4=fopen(f3,"r");
    if(fp1!=NULL || fp2!=NULL || fp3!=NULL || fp4!=NULL)
    {
    while((ch=fgetc(fp1))!=EOF)
    {
        fputc(ch,fp3);
    }
    fputc('\n',fp3);
    while((ch=fgetc(fp2))!=EOF)
    {
        fputc(ch,fp3);
    }
    fclose(fp1);
    fclose(fp2);
    fclose(fp3);
    printf("The merge of %s and %s into %s is successful!\nContents of %s is:\n",f1,f2,f3,f3);
    while((ch=fgetc(fp4))!=EOF)
    {
        printf("%c",ch);
    }
    fclose(fp4);
    }
    else
    {
        printf("Errors in opening files!!\n");
    }

    return 0;
}
```

Output

```
C:\cs lab\week 15\w15_2>type file1.txt
This is the first line of file1
This is the second line of file1
C:\cs lab\week 15\w15_2>type file2.txt
This is the second line of file2
This is the second line of file2
C:\cs lab\week 15\w15_2>type file3.txt

C:\cs lab\week 15\w15_2>gcc client.c

C:\cs lab\week 15\w15_2>a
Enter the name of first file:file1.txt
Enter the name of second file:file2.txt
Enter the file name where the contents of file1.txt and file2.txt to be copied:file3.txt
The merge of file1.txt and file2.txt into file3.txt is successful!
Contents of file3.txt is:
This is the first line of file1
This is the second line of file1
This is the second line of file2
This is the second line of file2
C:\cs lab\week 15\w15_2>type file3.txt
This is the first line of file1
This is the second line of file1
This is the second line of file2
This is the second line of file2
C:\cs lab\week 15\w15_2>
```

3)Problem 3

```c
lient.c > ...
#include<stdio.h>
int main()
{
    FILE *fp;
    char f[100];
    char ch;
    int n;
    printf("Enter the name of file:");
    scanf("%s",f);
    fp=fopen(f,"w");
    if(fp!=NULL)
    {
    printf("Enter the number of lines to be written on a file:");
    scanf("%d",&n);
    printf("Enter the lines:\n");
    for(int i=0;i<=n;i++)
    {
        while((ch=getchar())!='\n')
        {
            fputc(ch,fp);
        }
        if(ch=='\n')
            fputc(ch,fp);
    }
    fclose(fp);
    fp=fopen(f,"r");
    if(fp!=NULL)
    {
    printf("Contents of the file %s is:",f);
```

```c
    while((ch=fgetc(fp))!=EOF)
    {
        printf("%c",ch);
    }
    fclose(fp);
    }}
    else
    {
        printf("Errors in opening files!!\n");
    }

    return 0;
}
```

Output

```
Select Command Prompt

C:\cs lab\week 15\w15_3>gcc client.c

C:\cs lab\week 15\w15_3>a
Enter the name of file:f.txt
Enter the number of lines to be written on a file:5
Enter the lines:
This is line 1
This is line 2
This is line 3
This is line 4
This is line 5
Contents of the file f.txt is:
This is line 1
This is line 2
This is line 3
This is line 4
This is line 5

C:\cs lab\week 15\w15_3>type f.txt

This is line 1
This is line 2
This is line 3
This is line 4
This is line 5

C:\cs lab\week 15\w15_3>
```

4)Practice Problem 1

C: > cs lab > week 15 > w15_practice_1 > C client.c > ...

```c
#include <stdio.h>
#include <stdlib.h>
int main()
{
    FILE * fp;
    FILE * fp1;
    char f1[100];
    char f[1000];
    char newline[1000];
    int line, count;
    printf("Enter f1 of source file: ");
    scanf("%s", f1);
    printf("Enter line number to replace: ");
    scanf("%d", &line);
    fflush(stdin);
    printf("Replace '%d' line with: ", line);
    fgets(newline, 1000, stdin);
    fp  = fopen(f1, "r");
    fp1 = fopen("replace.tmp", "w");
    fp1 = fopen("replace.tmp", "w");
    if (fp == NULL || fp1 == NULL)
    {
        printf("\nError in opening file!\n");
        exit(0);
    }
    count = 0;
    while ((fgets(f, 1000, fp)) != NULL)
    {
        count++;
        if (count == line)
            fputs(newline, fp1);
        else
            fputs(f, fp1);
    }
    fclose(fp);
    fclose(fp1);
    remove(f1);
    rename("replace.tmp", f1);
    printf("\nSuccessfully replaced '%d' line with '%s'.", line, newline);
    return 0;
}
```

Output

```
Command Prompt
C:\cs lab\week 15\w15_practice_1>type f.txt
This is line 1
This is line 2
This line is not supposed to be here
This is line 4
This is line 5
C:\cs lab\week 15\w15_practice_1>gcc client.c

C:\cs lab\week 15\w15_practice_1>a
Enter path of source file: f.txt
Enter line number to replace: 3
Replace '3' line with: This is line 3

Successfully replaced '3' line with 'This is line 3
'.
C:\cs lab\week 15\w15_practice_1>type f.txt
This is line 1
This is line 2
This is line 3
This is line 4
This is line 5
C:\cs lab\week 15\w15_practice_1>
```

5)Practice Problem 2

C: > cs lab > week 15 > w15_practice_2 > C client.c

```c
#include<stdio.h>
int compare(FILE *fp1,FILE *fp2)
{
    char ch1,ch2,status=0;
    while(((ch1=fgetc(fp1))!=EOF) &&((ch2=fgetc(fp2))!=EOF))
        {
            if(ch1!=ch2)
            {
                status=1;
                break;
            }
        }
    return status;
}
int main()
{
    FILE *fp1,*fp2;
    char f1[100],f2[100];
    char ch1,ch2;
    int fstatus;
    printf("Enter name of a file:");
    scanf("%s",f1);
    printf("Enter name of a file:");
    scanf("%s",f2);
    fp1=fopen(f1,"r");
    fp2=fopen(f2,"r");
    if(fp1==NULL || fp2==NULL)
    {
        printf("Error in opening files!\n");
    }
    else
    {
    fstatus=compare(fp1,fp2);

    if(fstatus==0)
    {
        printf("%s and %s have same contents\n",f1,f2);
    }
    else
    {
        printf("%s and %s have different contents\n",f1,f2);
    }
    }
    fclose(fp1);
    fclose(fp2);
    return 0;
}
```

Output

Command Prompt

```
C:\cs lab\week 15\w15_practice_2>gcc client.c

C:\cs lab\week 15\w15_practice_2>a
Enter name of a file:f1.txt
Enter name of a file:f2.txt
f1.txt and f2.txt have same contents

C:\cs lab\week 15\w15_practice_2>type f1.txt
Hello
Hi
Welcome to C programming
C:\cs lab\week 15\w15_practice_2>type f2.txt
Hello
Hi
Welcome to C programming
C:\cs lab\week 15\w15_practice_2>a
Enter name of a file:f1.txt
Enter name of a file:f3.txt
f1.txt and f3.txt have different contents

C:\cs lab\week 15\w15_practice_2>type f1.txt
Hello
Hi
Welcome to C programming
C:\cs lab\week 15\w15_practice_2>type f3.txt
Hi
Hello
I like c programming
C:\cs lab\week 15\w15_practice_2>
```