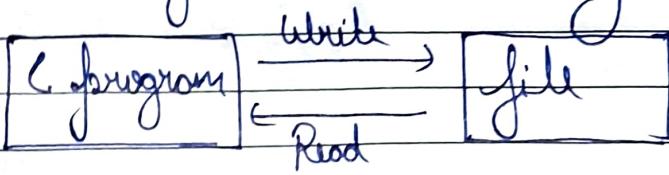


Chapter 10 - file I/O:

The random-access memory is volatile, and its content is lost once the program terminates. In order to persist the data forever we use files.

A file is data stored in a storage device.

An program can talk to the file by reading content from it and writing content to it.



file pointer

A "file" is a structure which needs to be created for opening the file.

A file pointer is a pointer to this structure of the file.

(file pointer is needed for communication between the file and the program).

A file pointer can be created as follows

```
FILE *ptr;
```

```
ptr=fopen("filename.ext","mode");
```

file Opening Modes in C

The modes "r", "w", "a" offer the programmer to select a mode for opening a file.

Following modes are primarily used in C files I/O:

"r" → Open for reading. No binary files.

"rb" → Open for reading in binary.

"w" → Open for writing. If the file exists, the contents

of the file will be overwritten.

"wb" → Open for writing in binary.

"a" → Open for append. If the file does not exist, it will be created.

Types of files

primarily there are two types of files:

(1). Text files (.txt, .c)

(2). Binary files (.jpg, .dat)

Reading a file

A file can be opened for reading as follows:

```
FILE *ptr;  
ptr = fopen("Harry.txt", "r");  
int num;
```

Let us assume that "Harry.txt" contains an integer we can read it that integer using

```
scanf(ptr, "%d", &num); // Scanf is file counterpart  
of Scanf()
```

This will read an integer from file in's New variables.

Modify the program above to check whether the file exists or not before opening file i.e. if Harry.txt does not exist then do not read it.

closing the file

It is very important to close the file after we read or write. This is achieved by using `fclose` as follows.

```
fclose(ptr);
```

This will tell the compiler that we are done working with this file and the associated resources could be freed.

Write to A file

We can write to a file in a very similar manner like we read the file.

```
FILE *ptr;
```

```
ptr = fopen("Harry.txt", "w");
```

```
int num = 432;
```

```
fprint(ptr, "%d", num);
```

```
fclose(ptr);
```

fgetc() and fputc()

`fgetc` and `fputc` are used to read and write a character from/to a file.

```
fgetc(ptr); // used to read a character
```

```
fputc('c', ptr); // used to write a character ('c') to the file
```

EOF : End of file
fgetc() returns EOF when all the characters from a file have been read so we can write a check like below to detect End of file (EOF).

```
while(1) { // loop forever until file is full
    ch = fgetc(ptr); // when all the content of a
                      // file has been read break
    if(ch == EOF)      // the loop! exit
        break;          // if a condition not met
    } // Code
}
```

Chapter 10 - Practice Set

Q1) write a program to read three integers from a file

```
#include <stdio.h>
int main() {
    FILE *ptr;
    int num1, num2, num3;
    ptr = fopen ("file.txt", "r");
    fscanf(ptr, "%d %d %d", &num1, &num2,
           &num3);
    printf ("The values are %d %d %d\n",
            num1, num2, num3);
    fclose(ptr);
    return 0;
}
```

Q2) write a program to generate multiplication table of a given number in text format.
Make sure that the file is readable and well formatted.

Q2) #include <stdio.h>

int main () {

FILE *fptr; /* pointer to a file */

int num=4; /* this will be our number */

fptr=fopen ("table.txt", "w"); /* open file for writing */

for (int i=0; i<10; i++) { /* loop */

fprintf (fptr, "%d", num*(i+1)); /* print */

fprintf (fptr, "%c", '\n'); /* new line */

return 0; } /* end of main */

Q3) write a program to read & read a text file character by character and write its content into another Separate file. (using FILE pointer)

#include <stdio.h>

int main () {

char ch; /* to store all chars */

FILE *ptr; /* file pointer */

FILE *ptr2;

ptr=fopen ("Harry.txt", "r"); /* open */

ptr2=fopen ("Harry3.txt", "a"); /* open */

while (1)

{ ch=fgetc (ptr);

if (ch==EOF)

{ break;

```
    } while (choice != 3);
    else if (choice == 1)
        printt (ptr2, "%c", ch);
    else if (choice == 2)
        printt (ptr2, "%c", ch);
    else
        printt ("%c", ch);
}
} // return 0;
```

}

else if (choice == 2)

cout << "Enter the name : "

Q43 Take name and salary of two employees as input from the user and write them to a text file in the following format :-

(i) Name 1, 3300

(ii) Name 2, 7700

3

```
#include <stdio.h>
int main () {
```

```
FILE *ptr;
char name1[34], name2[34];
```

```
int Salary1, Salary2;
```

```
ptr = fopen ("Salary.txt", "w");
```

```
printf ("Enter the name of Employee 1\n");
scanf ("%s", name1);
```

```
printf ("Enter the salary of Employee 1\n");
scanf ("%d", &Salary1);
```

```
printf ("Enter the name of the Employee 2\n");
scanf ("%s", name2);
```

(step 1)

(step 2)

```
printf("Enter the salary of Employee 2\n");
scanf("%d", &Salary2);
```

```
fprintf(ptr, "%s", name1);
fprintf(ptr, "%s", " ", );
fprintf(ptr, "%d", Salary1);
fprintf(ptr, "%c", '\n');
if (printf(ptr, "%s", name2));
if (printf(ptr, "%s", " ", ));
fprintf(ptr, "%d", Salary2);
fprintf(ptr, "%d");
```

return 0;

Q5) Write a program to modify a file containing an integer to double its value.

```
#include <stdio.h>
int main() {
    FILE *ptr;
    int num;
    ptr = fopen("int.txt", "r");
    fscanf(ptr, "%d", &num);
    fclose(ptr);
}
```

```
ptr = fopen("int.txt", "w");
printf(ptr, "%d", 2 * num);
```

```
fclose(ptr);
return 0;
```