MA 511: Computer Programming

Lecture 14: File read and write

http://www.iitg.ernet.in/psm/indexing_ma511/y10/index.html

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I/O

- Buffer
  - A segment of memory used to hold data while it is being processed.
  - In a program, buffers are created to hold some amount of data from each of the files that will be read or written.
- File
  - A bunch of blocks of information written on your hard-drive
  - OS knows the location and order of blocks and will present you with a continuous view of file.
- FILE (as in File *)
  - A data structure that holds file information
    - What file
    - Current position in file
    - Permissions (read, write)

Data Files

Example:

```
#include <stdio.h>
main(){
    FILE *fp;
    int i;
    fp = fopen("output.dat", "w");
    if(fp==NULL)
        printf("Error for opening a file\n");
    for(i=65; i<90; i++)
        fprintf(fp, "%c\n", i);
    fclose(fp);
}
```

output.dat

A
B
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y

Data Files

Example:

```
#include <stdio.h>
main(){
    FILE *fp;
    int i;
    fp = fopen("output.dat", "w");
    if(fp==NULL)
        printf("Error for opening a file\n");
    for(i=65; i<90; i++)
        fprintf(fp, "%c\n", i);
    fclose(fp);
}
```

FILE: spl structure type that establishes the buffer area

fp : pointer variable pointing to the beginning of the buffer area.

fp=fopen(file-name, file-type);

“r” : open a existing file for reading

“w”: opening a new file for writing, overwrite if file exist.

“a” : opening an existing file for appending, create if not exist.

“r+”: opening an existing file for read and write.

“w+”: opening a new file for both reading & writing, overwrite if file exist.

“a+”: opening a new file for reading and appending, create if not exist.

Reading a Data File

Example:

```
#include <stdio.h>
main(){
    FILE *fp1;
    char ch;
    fp1 = fopen("output.dat", "r");
    if(fp1==NULL)
        printf("Error for opening a file\n");
    else{

        while(!feof(fp1)){
            fscanf(fp1, "%c", &ch);
            printf("%c",ch);
        }
    }
    fclose(fp1);
}
```

Assignment

- Write a C program for inserting an integer before a given target value in a given array of integer.
- Write a C program for deleting a given value in a given array of integer.
- Write a C program for (i) writing integers 1-100 to a file (fwrite.dat) (ii) read data from the file fwrite.dat, identify numbers which are perfect square and write over a new file (newfile.dat).