LECTURE NO.1   **TIME: 30 MIN.**

PREVIEW OF TODAY'S TOPICS

A. Stream and Types, New Line and EOF Marker

Name: _____

Roll No: _____

Date: _____

## STREAM AND TYPES, NEW LINE AND EOF MARKER

EXTENSIVE QUESTION
Q.1 What is stream? Explain different types of streams.

SHORT QUESTIONS

(i)	What is stream?	(GRW2021)(SGD 2019-2021) (K.B)
(ii)	Write down the type of streams in file handling.	(DGK 2021)(LHR 2017)(U.B)
(iii)	What is text stream?	(LHR 2018-2022)(SWL 2022)(FSD 2021)(K.B)
(iv)	Define EOF Marker.	(RWP 2022)(BWP 2021)(MTN 2021)(K.B)
(v)	Compare text and binary stream	(RWP 2019) (U.B)

STREAM
Def: A stream is a logical interface to a file. A stream is associated to a file using an open operation. A stream is disassociated from a file using a close operation.
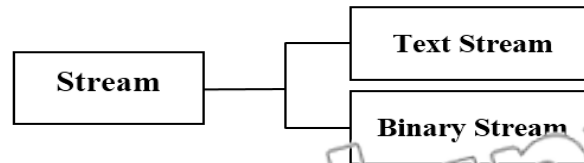
- **Text Stream:**
  - A flow of characters from a source to a destination is called text stream.
  - In text stream characters are converted in to bytes.
  - There is not a one to one relation between the characters and bytes.
  - The number of characters and number of bytes may not be same when characters are converted in to bytes.

  Example

  A new line in stored as a carriage return and line feed pair.

- **Binary System:**
  - A flow of bytes from a source to a destination is called binary stream.
  - No translation is required in binary stream.
  - There is one to one correspondence between the bytes read to written and those on external device.
  - Binary stream can be used to transfer any type of data

EOF MARKER
- A text file is a named collection of characters saved in secondary storage devices.
- The text file has no fixed size.
- To mark the end of a text file, a special end of file character (EOF) is placed after the last character.

MULTIPLE CHOICE QUESTIONS

Q.No.1

(i) A file is stored in:
    (a) RAM   (b) ROM
    (c) Hard disk   (d) Cache

(ii) On Successfully closing a file, the fclose( ) returns: (RWP 2019)(SGD 2019)
    (a) **0**   (b) NULL
    (b) 1   (d) File Pointer

(iii) A stream is associated to a file by using which operation?
    (a) Close   **(b) Open**   (c) Logical   (d) Binary

(iv) How many types of stream?
    (a) 3   (b) 4   (c) 5   **(d) 2**

(v) A _____can store text only: (LHR 2017)
    (a) Binary file   (b) Object file   (c) .exe file   **(d) Text file**

(vi) Which stream is a sequence of characters?
    (a) Text   (b) Binary   (c) Both a and b   (d) None

(vii) A binary stream is a sequence of the following with a one-to-one correspondence to external device.
    (a) Text   (b) Character   **(c) Bytes**   (d) Number

SHORT QUESTIONS

Q.No.2

Q.1 **What is stream?**   (GRW2021)(SGD 2019-2021) (K.B)

Ans: A stream is a logical interface to a file. A stream is associated to a file using an open operation and disassociated from a file using a close operation.

    There are two type of streams:
- Text stream
- Binary stream

Q.2 **Write down the type of streams in file handling.**   (DGK 2021)(LHR 2017)(U.B)

Ans: **There are two type of streams:**
- Text stream
- Binary stream

Q.2 **What is text stream?**   (LHR 2018-2022)(SWL 2022)(FSL 2021)(K.B)

Ans: A text stream is a sequence of characters. In text stream the certain character translations may occur. For example, new line may be converted to a carriage return/line feed pair. This means that there may not be a one-to-one relationship between the characters written and those in the external devices.

Q.3 **Define EOF Marker.**   (RWP 2022)(BWP 2021)(MTN 2021)(K.B)

Ans: A text file is a named collection of characters saved in secondary storage devices. The text file has no fixed size. To mark the end of a text file, a special end of file character (EOF) is placed after the last character.

Q.4 **Compare text and binary stream**   (RWP 2019) (U.B)

Ans:

Text Stream	Binary Stream
A text stream is a sequence of characters. In text stream the certain character translations may occur. For example, new line may be converted to a carriage return/line feed pair. This means that there may not be a one-to-one relationship between the characters written and those in the external devices	A binary stream is a sequence of bytes with one-to-one correspondence to those on the external device. It means that number of bytes written or read is the same as the number on the external device.

PREVIEW OF TODAY'S TOPICS

B. Opening a file, file opening mode, the file pointer, closing a file

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OPENING A FILE, FILE OPENING MODE, THE FILE POINTER, CLOSING A FILE

EXTENSIVE QUESTION

Q.1 Why it is necessary to open a file? Write the different modes of opening a file.

SHORT QUESTIONS

(i)	Define File Pointer.	**(MTN 2022)(DGK 2022)(K.B)**
(ii)	Write the syntax of fopen() function.	**(U.B)**
(iii)	Why it is necessary to open a file?	**(LHR2017) (U.B)**
(iv)	What is the meant by Closing a file?	**(BWP 2022)(SGD 2018)(U.B)**
(v)	How file is opened?	**(LHR 2021) (A.B)**

OPENING A FILE
- Before we can write a file to a disk or read it, we must open it.
- To open a file and establishes a link with stream fopen() function is used.
- All standard file handling functions of C are declared in stdio.h.
- Thus it is included in almost every program.

Syntax:
The syntax of fopen function is:

    FILE* = fopen(const char* filename, const char* mode);

Example:
For example
```
FILE *fp;
if ( (fp = fopen("studata.txt", "r") == NULL)
{
        printf("Error  File can not open");
        exit(0);        }
```
- The fopen function takes two parameters.
- The first is the name of the file and second is open mode of file.
- The fopen function return the NULL pointer if it fail to open the file for some reason.

FILE POINTER
- A file pointer is a variable of type FILE. It is define in stdio.h.
- To declare a file pointer variable, a statement like the following is used

Syntax:

    FILE *fp;

- The variable fp represents a pointer to an FILE type variable.

FILE OPENING MODES
- A file can be open in reading (r), writing (w), append (a), reading and writing (R+), over written and for reading and writing (w+), reading and appending mode (A+).
- **FILE OPENING MODES**

r	Open a text for reading. The file must already exist.
w	Open a text file for writing. If the file already exists its contents are overwritten. If it does not exist. It will be created.
a	Open a text file for append. Data is added to the end of the existing file. If the file does not exist, it is created.
r+	Open a text file for both reading and writing. The file must already exists
w+	Open a text file for reading and writing and its contents are over written. If the file does not exists. It is created.
a+	Open a text file for both reading and appending. If the file does not exist. It is created for both reading and writing.

CLOSE A FILE

- When a file has no further use, it should be close with fclose() function.

Syntax:

The syntax of fclose function is:

int fclose (FILE *fp)

- The fclose() function closes the file associated with fp.
- The fclose() function returns 0 if successful and EOF if an error occur.

MULTIPLE CHOICE QUESTIONS

Q.No.1

(i) **On successfully closing file, the fclose ( ) returns:** (LHR 2022) (FSD 2022)

(A) Null (B) 0(zero)
(C) 1(one) (D)file pointer

(ii) **_____mode opens only an existing file for both reading and writing.**

(GRW 2022)(LHR 2018)

(A) "W" (B) "W+"
(C) "r+" (D) "a+"

(iii) **The fopen () function uses parameters :** (SGD 2018)

(a) 1 **(b) 2**
(c) 5 (d) 4

(iv) **The fopen () function return the which pointer if it fails to open the file?**

(a) BOF (b) EOF
(c) **NULL** (d) CLOSE

(v) **Which of the following mode open a text file for append?**

(a) r+ (b) w+
(c) **a** (d) r

(vi) **The fclose () function return which of the following if an error occurs?**

(a) BOF **(b)** NULL
(c) EOF (d) 1

SHORT QUESTIONS

Q.No.2

Q.1 **Define File Pointer.** (MTN 2022)(DGK 2022)(K.B)

Ans: A file pointer is a variable of type FILE. It is define in stdio.h. The declare a file pointer variable a statement like the following is used

FILE *fp;

The variable fp represents a pointer to an FILE type variable.

Q.2 **Write the syntax of fopen() function.** (U.B)

Ans: The syntax of fopen function is

FILE* = fopen (const char* filename, const char* mode);

The fopen function takes two parameters. The first is the name of the file and second is open mode of file. The fopen function return the NULL pointer if it fail to open the file for some reason.

Q.3 **Why it is necessary to open a file?** (LHR 2017) (U.B)

Ans: Before we can write a file to a disk, or read it. We must open it. To open a file and establishes a link with stream fopen() function is used. All standard file handling functions of C are declared in stdio.h. Thus it is included in almost every program.

Q.4 **What is the meant by Closing a file?** (BWP 2022)(SGD 2018)(U.B)

Ans: When a file has no further use, it should be close with fclose() function. The syntax of fclose function is

int fclose (FILE *fp)

The fclose() function closes the file associated with fp. The fclose() function returns 0 if successful and EOF if an error occur.

Q.5 **How file is opened?** (LHR 2021)(U.B)

Ans: Before we can write a file to a disk, or read it. We must open it. To open a file and Establishes a link with stream fopen() function is used. All standard file handling functions of C are declared in stdio.h. Thus it is included in almost every program.

The syntax of fopen function is

FILE* = fopen(const char* filename, const char* mode);

CHAPTER NO.14
(FILE HANDLING IN C)

TOPICS OF THE DAY	Name: _____
C. Reading and written character to a file, String handling	Roll No: _____
	Date: _____

READING AND WRITTEN CHARACTER TO A FILE, STRING HANDLING

EXTENSIVE QUESTION
Q.1   What is array and string explain with examples?

SHORT QUESTIONS

(i)	**What is string?**	**(K.B)**
(ii)	**What is string assignment?**	**(FSD 2022)(K.B)**
(iii)	**What is the getc() function?**	**(K.B)**
(iv)	**What is the putc() function?**	**(K.B)**
(v)	**What is the fgets() function?**	**(SWL2019)(K.B)**

READING AND WRITTEN CHARACTER TO A FILE
Once a file has been opened, depending upon its opening mode, a character can be read from or written to it by using the following two functions.

> **int getc(FILE* fp)**
>
> **int putc(int ch FILE* fp)**

getc() function
The getc() function reads the next character from the file and return it as integer and if error occur or end of file is encountered it returns EOF.

The syntax of getc function is

> **int getc(FILE* fp);**

putc() function
The putc() function writes the character to the file. The putc() function returns the character written if successful or EOF if an error occurs.

The syntax of putc() function is

> **int putc(int ch, FILE* fp);**

The putc() function write the character stored in ch to file associated with fp. The variable ch may be define as int or as char.

STRING HANDLING:
For example we may want to keep a list of names and telephone numbers of our friends, a shopkeeper may need to prepare records of items and their prices in his shop, and a law enforcement agency might be interested in keeping records of criminals including their names, pictures, telephone numbers and addresses. In all of these cases we need to handle strings.

In different programs, we have been displaying strings on screen with printf() functions. But still we are not familiar with string variables _ the way C stores a string in a variable. Unlike variables of different numeric data types, C follows a different approach to handle strings. It stores a string as an array of characters. An array is a group of contiguous

memory locations, which can store data of the same data type. Let us see how we can declare an array in C?

The general form is:

Data __ type arr-name [n];

The *data __ type* specify the type of data that is stored in every memory location of the array, arr__name describe the array name, and 'n' is the subscript of array which shows the total number of memory locations in the array.

For example, the statements:

Int balls [6];

Double temperature [10];

Define two arrays named balls and temperature (two sets of six and ten contiguous memory locations as shown below). In balls, we can store six integer values, whereas in temperature, we can store ten floating point values. Each value of array can be accessed via its subscripts. For example, consider the following statements:

balls[0]=4;	temperature [0]=37;
balls [1]=0;	temperature [2]=26;
Balls [4]=6;	temperature [3]=19;

0	1	2	3	4	5
4	0			6	

Balls [6]

0	1	2	3	4	5	6	7	8	9
37		26	19						

Temperature [10]

DECLARING AND INITIALIZING STRING VARIABLES

A string is an array of type char. So declaring a string variable is the same as declaring an array of type char. for example

char sname[16];

The variable sname can hold 16 characters. The last character of every string is '\0' (null terminator), which indicates the end of string. In C, the string can be initialized like other variables for example

char name[16]= "Lahore";

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
l	a	h	o	r	e	\0									

STRING ASSIGNMENT

Assigning a value to a string variable is not same as the assignment of other variables in C. So the following statement will generate error.

sname = "pakistan";

C language provide a library string.h for string manipulation. This library contains many functions to manipulate strings. The function strcpy is used to copy a string to another string variable. The syntax of strcpy function is

char *strcpy(char * dest, const char* source);

For example:

strcpy(sname, "pakistan");

In the above example the statement will successfully copy the string pakistan to the variable sname

MULTIPLE CHOICE QUESTIONS

Q.No.1

(i) **Which of the following function write string to FILE*?**

(SWL2019-2022)(GRW2019)(LHR 2018)

(a) gets ()   **(b) fgets()**   **(c)** fgetch()   **(d)** fputs()

(ii) **An Array subscript should be:**   *(MTN 2022)*

(a) float   **(b) int**

(c) double   **(d)** An array

(iii) **The function that read the next character from the file is:**   *(LHR 2017)*

(a) getch()   **(b) getc()**   **(c)** putc()   **(d)** gete()

(iv) **Which of the following function writes the character to associated stream?**

| (a) putc() | (b) fputc() | (c) fputs() | (d) None of these |

(v) **The fputs () function write which pointer to the associated stream?**

| (a) int | (b) String | (c) Character | (d) Float |

(vi) **The last character of every string is:**

| (a) /0 | (b) Null | (c) 0 | (d) 1 |

SHORT QUESTIONS

Q.N.2

Q.1 **What is string?**

Ans: A string is an array of type char. So declaring a string variable is the same as declaring an array of type char.

For example:

char sname[16];

The variable sname can hold 16 characters. The last character of every string is '\0' (null terminator),

Q.2 **What is string assignment?** **(FSD 2022)(K.B)**

Ans: Assigning a value to a string variable is not same as the assignment of other variables in C. So the following statement will generate error.

sname = "pakistan";

C language provide a library string.h for string manipulation. This library contains many functions to manipulate strings. The function strcpy is used to copy a string to another string variable. The syntax of strcpy function is

char *strcpy(char * dest, const char* source);

Q.3 **What is the getc() function.**

Ans: The getc() function reads the next character from the file and return it as integer and if error occur or end of file is encountered it returns EOF.

The syntax of getc function is

int getc(FILE* fp);

Q.4 **What is the putc() function.**

Ans: The putc() function writes the character to the file. The putc() function returns the character written if successful or EOF if an error occurs.

The syntax of putc() function is

int putc(int ch, FILE* fp);

The putc() function write the character stored in ch to file associated with fp. The variable ch may be define as int or as char.

Q.5 **What is the fputs() function.**

Ans: The fputs() function write a string of character to a file. The general syntax of fputs() function is

int fputs(char *sr, FILE *fp)

REVISION LECTURE NOTES
CHAPTER NO.14
(FILE HANDLING IN C)

2nd YEAR COMPUTER

LECTURE NO.4　　　　　　　　　　　　　　　　　　**TIME: 30 MIN.**

TOPICS OF THE DAY	
D.　String handling in text Files, Formatted I/O	Name: _____
	Roll No: _____
	Date:

STRING HANDLING IN TEXT FILES, FORMATTED I/O

EXTENSIVE QUESTION

Q.1   What the names of functions that are used for formatted I/O in C language and give example.

SHORT QUESTIONS

(i)   What is the fgets () function?   (K.B)

(ii)   What is fputs () function?   (K.B)

(iii)   What the names of functions that are used for formatted I/O in C language?   (K.B)

STRING HANDLING IN TEXT FILES

When working with text files, C provides four functions which make file operations easier. The first two are called fputs() and fgets(), which write or read a string from a file respectively.

Their prototypes are:

        int fputs(char *str, FILE *fp)

        char *fgets(char *str, int num, FILE * fp)

fputs() function.

The fputs() function write a string of character to a file. The general syntax of fputs() function is

int fputs(char *sr, FILE *fp)

fgets() function.

The fgets() function read string of characters from the file. The general syntax of fgets() function is

char *fgets(char *str, int num, FILE *fp)

The fgets() function return null pointer if an error occur

FORMATTED I/O

C language provide many formatted input and output functions. These functions are used to read and write data in the specified format into the file. The most important formatted I/O functions are fprintf() and fscanf(). These functions operate exactly the same as printf() and scanf() except they works with files.

Example

Write a program that accept name and address of students and write them into a text file using formatted I/O.

```
#include<stdio.h>
#include<conio.h>
#include<string.h>

void main()
{
        FILE *fw;
```

```
                char name[20];
                char add[30];
                if ( (fw = fopen("sdata.txt", "w") ) == NULL)
                        printf( "Error: File can not open");
                else
                {
                do {
                        printf(" Enter the name or press enter to quit ");
                        gets(name);
                        if( strlen(name) > 0)
                                {
                                        printf(" Enter the address: ");
                                        gets(add);
                                        fprintf(fw, "%s ! %s \n", name, add);
                                }
                }while( strlen(name) > 0);
                fclose(fw);
                }
        }
```

MULTIPLE CHOICE QUESTIONS

Q.No.1

(i) **Which of the following is used to read string of character from a file?**

(a) putc()   (b) fgets()
(c) fputs()   (d) None of these

(ii) **Which of the following is used to write string of character to a file?**

(a) putc()   (b) fgets()
(c) fputs()   (d) None of these

(iii) **Which value is return by fgets() function if an error occurs?**

(a) 0   (b) 1

(c) Null Pointer   (d) All of these

SHORT QUESTIONS

Q.No.2

Q.1 **What is the fgets() function.**
Ans: The fgets() function read string of characters from the file. The general syntax of fgets() function is
char *fgets(char *str, int num, FILE *fp)
The fgets() function return null pointer if an error occur

Q.2 **What is fputs() function.**
Ans: The fputs() function write a string of character to a file. The general syntax of fputs() function is

int fputs(char *sr, FILE *fp)

Q.3 **What the names of functions that are used for formatted I/O in C language**
Ans: C language provide many formatted input and output functions. These functions are used to read and write data in the specified format into the file. The most important formatted I/O functions are fprintf() and fscanf(). These functions operate exactly the same as printf() and scanf() except they works with files.

STUDENTS LEARNING OBJECTIVES (SLOs)

MULTIPLE CHOICE QUESTIONS

Knowledge Based Questions

(i) **Which is a set of related records?**
    (a) Stream   **(b) File**
    (c) Function   (d) String

(ii) **A stream is disassociated from a file using which operation?**
    (a) Open   (b) Binary
    (c) Text   **(d) Close**

(iii) **Which is used to open a file and associate it with stream?**

(a) open ( )   **(b) fopen( )**

(c) fclose( )   (d) fop ( )

(iv)   **The fclose() function return _____ if an error occurs.**

(a) BOF   (b) NULL

(c) EOF   (d) 1

(v)   **The pointer variable holds the _____ of another memory cell.**

(a) Value   **(b) Address**

(c) Name   (d) None of these

Understanding Based Questions

(i)   **The fopen () function return the _____ pointer if it fails to open the file.**

(a) BOF   (b) EOF

(c) NULL   (d) CLOSE

(ii)   **The first parameter of fopen() function is the:**

(a) Mode   **(b) File name**

(c) "w"   (d) IF

(iii)   **Which of the following mode open a text file for append?**

(a) r+   (b) w+

(c) a   (d) r

(iv)   **How many types of streams?**

(a) 3   (b) 4

(c) 5   **(d) 2**

(v)   **Which of the following function writes the character to associated stream?**

(a) put c   **(b) fput c**

(c) fputs   (d) None of these

Application Based Questions

(i)   **Which of the following mode open a file for both reading and writing, and file must always exist?**

(a) r   (b) w

(c) a   **(d) r+**

(ii)   **The last character of every string is:**

(a) /0   (b) Null

(c) \0   (d) 1

(iii)   **Which of the following is the valid example of string declaration?**

(a) int name [10];   (b) char name [10]

(c) char str [16];   (d) string s

(iv)   **Which of the following is the valid example of string initialization?**

(a) name = "KIPS";   **(b) char name [10] ='KIPS";**

(c) name = KIP;   (d) None of these

(v)   **Array can store data of which type?**

(a) Same   (b) Different

(c) Any   (d) None of these

SHORT QUESTIONS

Knowledge Based Questions

Q.1   **What is stream?**

Ans: A stream is a logical interface to a file. A stream is associated to a file using an open operation and disassociated from a file using a close operation. There are two type of streams:

- **Text stream**
- **Binary stream**

Q.2   **What is binary stream?**

Ans: A binary stream is a sequence of bytes with one-to-one correspondence to those on the external device. It means that number of bytes written or read is the same as the number on the external device.

Q.3   **What is file pointer?**

Ans: A file pointer is a variable of type FILE. It is define in stdio.h. The declare a file pointer variable a statement like the following is used

    FILE *fp;

Where fp is a FILE pointer type variable

Q.4   What is the getch() function.

Ans: The getch() function reads the next character form the file and return it as integer and if error occur or end of file is encountered it returns EOF.

The syntax of getc function is

    int getc(FILE* fp);

Q.5   What is the putc() function.

Ans: The putc() function writes the character to the file. The putc() function returns the character written if successful or EOF if an error occurs.

The syntax of putc() function is

    int putc(int ch, FILE* fp);

The putc() function write the character stored in ch to file associated with fp. The variable ch may be define as int or as char.

Understanding Based Questions

Q.1   Why it is necessary to open a file.

Ans: Before we can write a file to a disk, or read it. We must open it. To open a file and establishes a link with stream fopen() function is used. All standard file handling functions of C are declared in stdio.h. Thus it is included in almost every program.

Q.2   How to write fopen() function in C language?

Ans: The syntax of fopen function is

    FILE* = fopen(const char* filename, const char* mode);

The fopen function takes two parameters. The first is the name of the file and second is open mode of file. The fopen function return the NULL pointer if it fail to open the file for some reason.

Q.3   How to Closing a file in C language?

Ans: When a file has no further use, it should be close with fclose() function. The syntax of fclose function is

    int fclose (FILE *fp)

The fclose() function closes the file associated with fp. The fclose() function returns 0 if successful and EOF if an error occur.

Q.4   State the function of EOF.

Ans: A text file is a named collection of characters saved in secondary storage devices. The text file has no fixed size. To mark the end of a text file a special end of file character(EOF) is placed after the last character.

Q.5   What the names of functions that are used for formatted I/O in C language

Ans: C language provide many formatted input and output functions. These functions are used to read and write data in the specified format into the file. The most important formatted I/O functions are fprintf() and fscanf(). These functions operate exactly the same as printf() and scanf() except they works with files.

Application Based Questions

Q.1   How strcpy() function is used?

Ans: The function strcpy is used to copy a string to another string variable.

The syntax of strcpy function is

    char *strcpy(char * dest, const char* source);

Example:

    strcpy(sname, "pakistan");

Q.2   How string is declare?

Ans: A string is an array of type char. So declaring a string variable is the same as declaring an array of type char.

Example:

    char sname[16];

The variable sname can hold 16 characters. The last character of every string is '\0' (null terminator),

Q.3   How fgets() function works?

Ans: The fgets() function read string of characters from the file. The general syntax of fgets() function is

char * fgets(char *str, int num, FILE *fp)

The fgets() function return null pointer if an error occur

Q.4   Write two types file access methods?

Ans: Following are two types file access methods are:

    i.   Sequential access method

    ii.   Random access

Q.5   Why it is necessary to open a file. Write the different modes of opening a file.

Ans: Opening a file

Before we can write a file to a disk, or read it. we must open it. To open a file and establishes a link with stream fopen() function is used. All standard file handling functions of C are declared in stdio.h. Thus it is included in almost every program.

The syntax of fopen function is

FILE* = fopen(const char* filename, const char* mode);