File handling in C++:

File: represents storage medium for storing data or information.

Streams: refer to sequence of bytes.

ofstream: represents the output streams and used for writing in files.
ifstream: represents the input streams and used for reading from files.
fstream: represents both input stream and output stream. used for reading from and writing in files.

Operations in file:

open(): creating a file.
read(): reading data from a file.
write(): writing new data to a file.
close(): closing a file.

File creation:

Filepointer.open("path", ios::mode);

mode:
out: writing
in: reading
app: appending
trunc: truncating

//creating/opening a file:

```
#include<iostream>
#include<fstream>
using namespace std;

int main()
{
        fstream s;
```

```
	s.open("D:/JU/2022 1st sem/IT 2nd year/ab.txt", ios::out);
                                        // D:\\JU\\2022 1st sem\\IT 2nd year\\ab.txt

	if(!s) //s==NULL
	{
		cout<<"file creation failed: \n";
	}
	else
	{
		cout<<"new file created: \n";
		s.close();
	}
}
```

//writing to a file:

```
#include<iostream>
#include<fstream>
using namespace std;

int main()
{
	fstream s;

	s.open("D:/JU/2022 1st sem/IT 2nd year/ab.txt", ios::out);

	if(!s) //s==NULL
	{
		cout<<"file creation failed: \n";

	}
	else
	{
		cout<<"file opened: \n";
		s<<"Hello world: ";
		s.close();
	}
}
```

//reading from a file: [character by character]

```
#include<iostream>
#include<fstream>
using namespace std;

int main()
{
	ifstream s;

	s.open("D:/JU/2022 1st sem/IT 2nd year/IT_1.txt", ios::in);

	if(!s) //s==NULL
	{
		cout<<"file creation failed: \n";

	}
	else
	{
		char ch;
		while(!s.eof())
		{
			s>>ch;    //retrieving each character from the file..
			cout<<ch; //print it to the console
		}

		s.close();
	}

}
```

```
#include<iostream>
#include<fstream>
using namespace std;

int main()
{
	ofstream fout;
	string line;

	fout.open("D:/JU/2022 1st sem/IT 2nd year/abc.txt");
```

```
        cout<<"Enter data to the file: ";
        while(fout)
        {
                getline(cin,line); //take a line from standard input

                if(line=="-1")
                 break;

                 fout<<line<<endl;
        }

        fout.close();

        ifstream fin;
        fin.open("D:/JU/2022 1st sem/IT 2nd year/abc.txt");
        while(fin)
        {
                getline(fin,line);  //read a line from file
                cout<<line<<endl;
        }

        fin.close();

}
```

Special operations:

put(): it writes a single character to file.
get(): it reads a single character from a file.

tellp(): tells the current position of the put pointer.
    filepointer.tellp()
tellg(): tells the current position of the get pointer.
    filepointer.tellg()

seekp(): moves the put pointer (output) to the mentioned location.
    filepointer.seekp(no of bytes, reference mode)
seekg(): moves the get pointer (input) to the mentioned location.
    filepointer.seekg(no of bytes, reference point)

3 reference points are passed:

ios::beg -> beginning from a file.
ios::cur -> current position in the file.
ios::end -> end of the file.

//implementing tellp() and seekp() operations in file:

```
#include<iostream>
#include<fstream>

using namespace std;

int main()
{
	fstream st;
	st.open("D:/JU/2022 1st sem/IT 2nd year/abcd.txt", ios::out);

	if(!st)
	{
		cout<<"file creation failed:" ;
	}

	else
	{
		cout<<"file created: \n" ;

		st<<"Hello";
		cout<<"File pointer position: "<<st.tellp()<<endl;   //5

		st.seekp(-1, ios::cur);
		cout<<"As per tellp: current File pointer position: "<<st.tellp()<<endl;  //4

	      st.seekp(2, ios::cur);
		cout<<"As per tellp: current File pointer position: "<<st.tellp()<<endl; //6
	}

}
```

```
#include<iostream>
#include<fstream>
```

```
using namespace std;

int main()
{
	fstream st;
	st.open("D:/JU/2022 1st sem/IT 2nd year/abcd.txt", ios::out);

	if(!st)
	{
		cout<<"file creation failed:" ;
	}

	else
	{
		cout<<"file created: \n" ;

		st<<"Hello";
		cout<<"File pointer position: "<<st.tellp()<<endl;   //5

		st.seekp(-1, ios::cur);
		cout<<"As per tellp: current File pointer position: "<<st.tellp()<<endl;  //4

	   st.seekp(2, ios::cur);
		cout<<"As per tellp: current File pointer position: "<<st.tellp()<<endl; //6

		st.close();
	}

	 //reopening the file in input mode:

		st.open("D:/JU/2022 1st sem/IT 2nd year/abcd.txt", ios::in);
		if(!st)
		{
			cout<<"no such file: \n";
		}
		else
		{
			char ch;
			st.seekg(-5, ios::end);
			cout<<"\n\nAs per tellg: File pointer position:"<<st.tellg()<<endl; //0

			st.seekg(2,ios::cur);
		      cout<<"As per tellg(): File pointer position:"<<st.tellg()<<endl; //2
```

```
                st.close();
            }


}
```

//after reaching -1, no file write operation can be performed: [pointer does not move further in the negative direction:]

```
#include<iostream>
#include<fstream>

using namespace std;

int main()
{
    fstream st;
    st.open("D:/JU/2022 1st sem/IT 2nd year/abcd.txt", ios::out);

    if(!st)
    {
        cout<<"file creation failed:" ;
    }

    else
    {
        cout<<"file created: \n" ;

        st<<"Hello";
        cout<<"File pointer position: "<<st.tellp()<<endl;   //5

        st.seekp(-4, ios::cur);     //st.seekp(-6, ios::cur); no updation
        cout<<"As per tellp: current File pointer position: "<<st.tellp()<<endl;  //0

      st<<"a";
      cout<<"As per tellp: current File pointer position: "<<st.tellp()<<endl;  //0

      st.seekp(2, ios::cur);
        cout<<"As per tellp: current File pointer position: "<<st.tellp()<<endl; // 2

        st.close();
    }
```

```
}
```