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Ques 1:- Draw the hierarchy of stream classes for file operations.

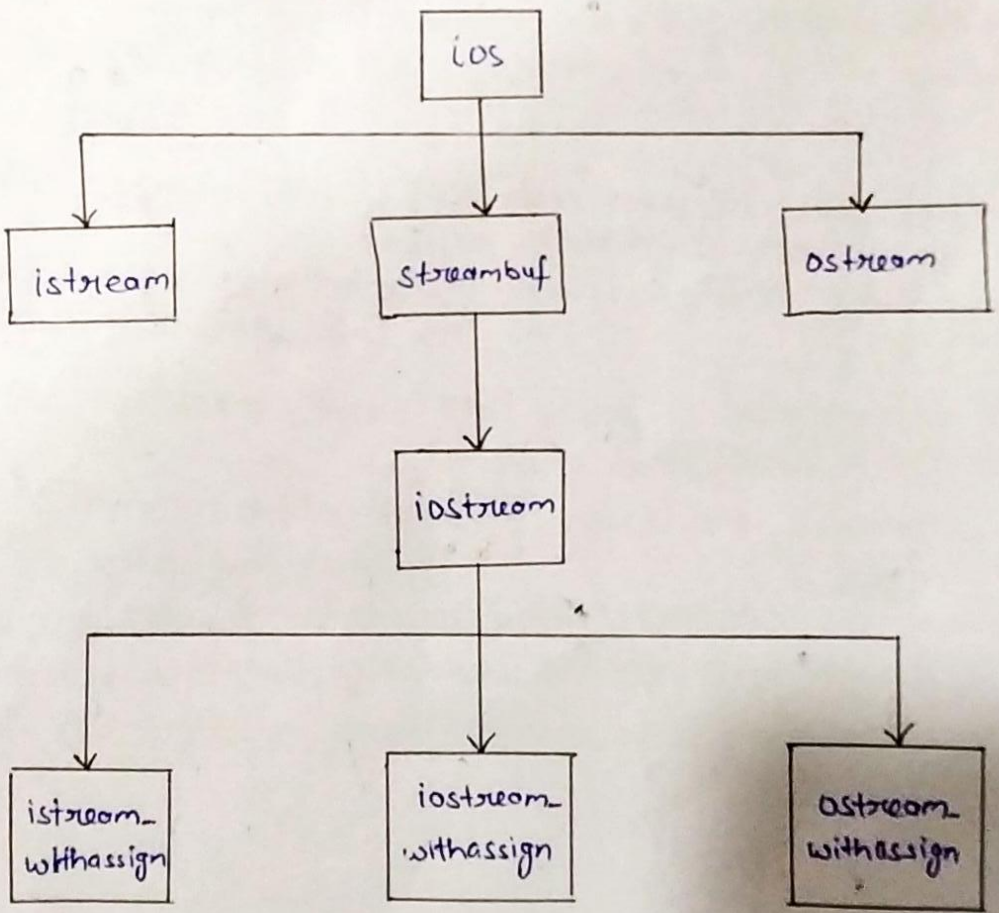
Ans:- Stream Classes:- A stream is nothing but a flow of data.

The streams are controlled using the classes.

In C++ there are number of stream classes for defining various streams related with files and for doing input-output operations.

The ios class is the base class. All other classes are derived from the ios class. These classes contain several member functions that perform input and output operations.

~~Stream~~ Hierarchy of stream classes for file operation:



⇒ Os class is topmost class in the stream classes hierarchy. It is the base class for istream, ostream, and streambuf class.

⇒ istream and ostream serves the base classes for iostream class. The class istream is used for input and ostream for the output.

⇒ class ios is indirectly inherited to iostream class using istream and ostream.

facilities provided by these stream classes:-

The ios class: The ios class is responsible for providing all input and output facilities to all other stream classes.

The istream class: This class is responsible for handling input stream. It provides number of function for handling chars, strings and objects such as get, getline, read, ignore, putback etc.

The ostream class: This class is responsible for handling output stream. It provides number of function for handling chars, strings and objects such as write, put etc.

The iostream class: This class is responsible for handling both input and output stream as both istream class and ostream class is inherited into it.

It provides function of both istream class and ostream class for handling chars, strings and objects such as get, getline, read, ignore, putback, put, write etc.

Ex:-

```
#include<iostream>
#include<fstream>
using namespace std;
int main()
{   ofstream filestream("lpu.txt");
 if(filestream.is_open())
 {
  filestream<<"Welcome to lpu\n";
  filestream<<"In phagwara\n";
  filestream.close();
 }
 else cout<<"File opening is fail.";
}
#include<iostream>
#include<fstream>
using namespace std;
int main(){
   string srg;
  ifstream filestream("lpu.txt");
  if(filestream.is_open()){
  { while(getline(filestream.srg))
  {  cout<<srg<<endl;
   }
   filestream.close();
  }
   else {
    cout<<"File opening is fail."<<endl;
   }
  }
```

Ques:2 Discuss fstream data type in detail :-

Ans:- In C++ the concept of the fstream is used for the reading and writing on the file system.

The fstream term stands for file stream.

Stream refers to a sequence of characters moving from the disk to c++ program or from the C++ program to the disk.

It is possible for inputting and outputting to take place in one session. This is made possible by the class template, basic-fstream.

Syntax:-

Below is a simple syntax for the fstream in the C++. In the below example first we are getting or creating a file, we can give any name to the file which we creating here. Second line we are writing content of the file

```
#include<fstream>
ofstream creatfile(Any file Name);
Createfile<<Any text ;
```

How fstream work in C++?:-

We can create a file if file does not exists like:-

- Here first we can create file instance with code like "ofstream of"; here of will be used as the instance.
- Next we can pass any name of file which we want to create like "open(any file name);"
- Finally, we can write the content on the file like cout <<"any contents and text data"<<endl;
- If needed, then we can also read the contents of the file with the help of the function of getline to read data

line by line.

Example of fstream:

```
#include<iostream>
#include<fstream>
using namespace std;
int main()
{
    string ln;

  ifstream testfile("text.txt");
  if(testfile.is_open()){
    while (getline(testfile, ln))
  {
    cout<<ln<<endl;
  }
  testfile.close();
 }
 else
   cout<< "File is not there on the given path.";
  return 0;

}
```

Output:-

File is not there on the given path.

Advantage of C++ fstream:-

→ It has the ability to perform dual work like it can create a file and at the same time it allows you to write the content on the file.

→ One of the most important things about it is, it allows us to use the concept of internalization and localization

→ It gives us a complete object oriented approach. Because of which we can reuse the features many times.

→ It has a features where if the file does not exist instead of throwing an error it will create the file for us.

Ques:3:- Write a program in C++ to create the file Ipu, Insert some text and read the contents of file.

Program 1:-

```
#include<iostream>
#include<fstream>
 using namespace std;
 int main()
   {
       ofstream filestream("Ipu.txt");
       if(filestream.is_open())
      {
      filestream<<"Hello Good Morning"<<endl;
      filestream<<"Welcome to Lovely Professional
                  University"<<endl;
     filestream<<"In Phagwara Jalandhar Punjab";
     cout<<"Open the file from other Program";
     filestream.close();
      }
     else
     cout<<"File Opening is fail.";
     return 0;
}
```

Output:-

Open the file from other Program.

Program :- 2

```
#include<iostream>
#include<fstream>
using namespace std;
int main()
{
    string s1g;
    ifstream filestream("lpu.txt");
    if(filestream.is_open())
    {
        while(getline(filestream, s1g))
        {
            cout<<s1g<<endl;
        }
        filestream.close();
    }
else
cout<< "File Opening is fail.";
return 0;
}
```

Output:-

```
Hello Good Morning
Welcome to Lovely Professional University
In Phagwara Jalandhar Punjab
```