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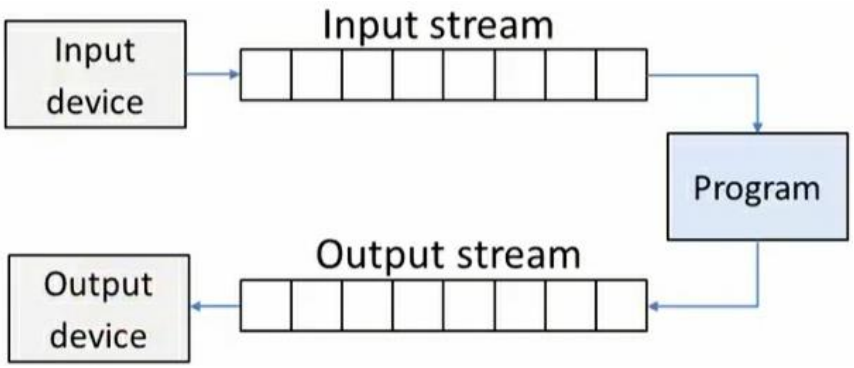
Input Output in C++

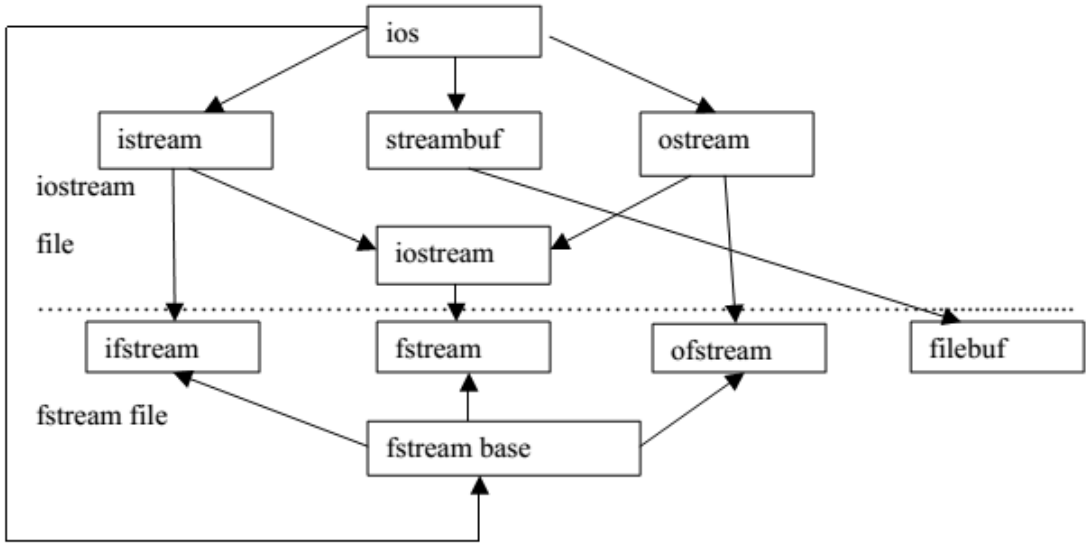
What is Streams: The sequence of bit or byte is called as stream.

Types of Streams

1. **Input Stream:** This is a type of stream where the bytes flow from a device such as a keyboard to the main memory.
2. **Output Stream:** This is a type of stream where the bytes flow in the opposite direction, that is, from main memory then to the device such as display screen.



Input Output Stream Classes in C++



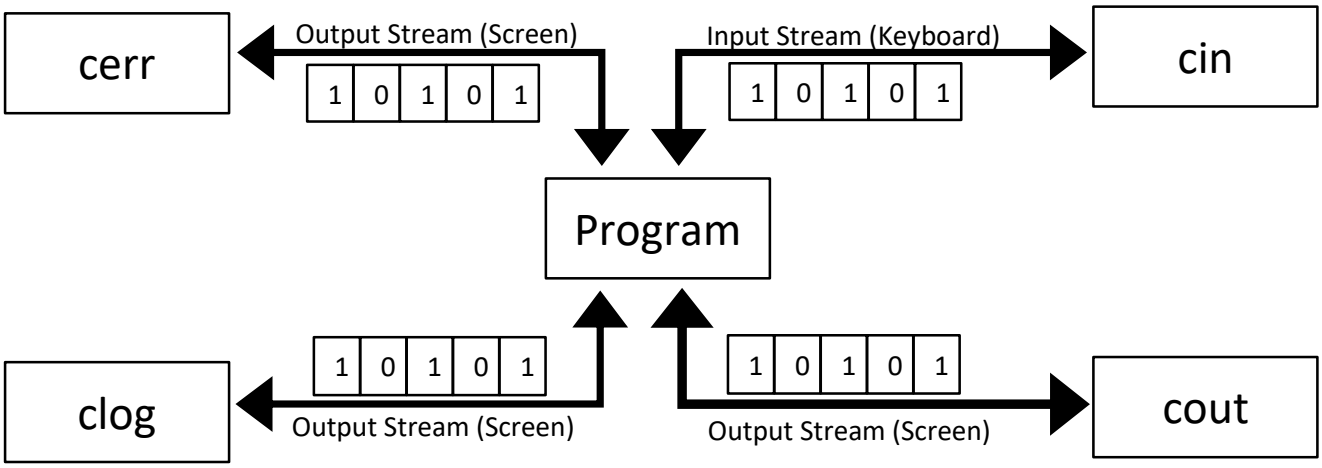
Stream classes for file operations

C++ Header files for Input/ Output

C++ provides three libraries that come with functions for performing basic input/out tasks.

1. **iostream:** It's an acronym for standard input/output stream. This header file comes with definitions for objects like cin/ cout/cerr.
2. **iomanip:** It's an acronym for input/output manipulators. The library comes with functions that can be used for the manipulation of streams. It contains definitions for objects like setw, setprecision, and others.
3. **fstream:** This is a header file for describing the file stream. It handles data that is read from file as input or that is written to a file, the output.

Input Output Stream Classes Object in C++



The major objects defined in the iostream header file are cin, cout, cerr, and clog.

1) **Standard Output Object (std::cout):** The cout object is an instance of the iostream class. It is used for producing output on a standard output device, which is normally the screen. It's used together with the stream insertion operator (<<).

Example:

```
#include<iostream>
using namespace std;
int main()
{
        cout<<"Hello Friends"<<endl;
        cout<<"Welcome to ShreeSoft";
}
```

2) **Standard Input Object (std::cin):** The cin object is an instance of the istream class. It reads input from the input device, the keyboard. It is normally used together with the extraction operator (>>). The extraction object is responsible for extracting data entered through the keyboard from the cin object.

Example:

```
#include<iostream>
using namespace std;
int main()
{
        int x,y;
        cout<<"Enter 2 Numbers:";
        cin>>x>>y;
        cout<<"Your Entered Numbers:"<<x<<","<<y;
}
```

3) **Standard Error Object (std::cerr):** The cerr object forms the standard error stream for outputting errors in C++. Cerr is an instance of the ostream class. The cerr object is unbuffered. This means it's used when an error message is to be displayed immediately. Since it's unbuffered, it doesn't store error message for a later display. It's used together with the stream insertion operator (<<).

Example:

```
#include<iostream>
using namespace std;
int main()
{
                cerr<<"Error are Occured";
}
```

4) **Standard log Object (std::clog):** The clog object is an instance of the ostream class. It's used to show errors on the standard display, the monitor. It's similar to the cerr object, but it's buffered. Since it's buffered, it stores the error message in buffer till the buffer is filled/flushed. It's used together with the stream insertion operator (<<).

Example:

```
#include<iostream>
using namespace std;
int main()
{
                clog<<"Error are Occured";
}
```