File Handling in C++

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- File handling provides a mechanism to store the output of a program in a file and to perform various operations on it.
- In C++, files are mainly dealt by using three classes fstream, ifstream, ofstream.
  - ofstream: This Stream class is applied to create files for writing information to files
  - ifstream: This Stream class is applied for reading information from files
  - fstream: This Stream class can be used for both read and write from/to files.

File Handling in C++

C++ provides us with the following operations in File Handling:

- Creating a file: open()
- Reading data: read()
- Writing new data: write()
- Closing a file: close()

Opening a File

- We can open a file using any one of the following methods:
  - First is bypassing the file name in constructor at the time of object creation.
  - Second is using the open() function.
- Syntax

```
void open(const char* file_name,ios::openmode mode);
```

Here, the first argument of the open function defines the name and format of the file.

The second argument represents the mode in which the file has to be opened.

File Modes

Sr. No.	Modes	Description
1	in	Opens the file to read(default for ifstream)
2	out	Opens the file to write(default for ofstream)
3	binary	Opens the file in binary mode
4	app	Opens the file and appends all the outputs at the end
5	ate	Opens the file and moves the control to the end of the file
6	trunc	Removes the data in the existing file
7	nocreate	Opens the file only if it already exists
8	noreplace	Opens the file only if it does not already exist

Opening a File

Example:

```
fstream new_file
new_file.open("fileName.txt",ios::out);
```

Here, new_file is an object of type fstream, as we know fstream is a class so we need to create an object of this class to use its member functions. So we create new_file object and call open() function. Here we use out mode that allows us to open the file to write in it.

Default Open Modes :

- ifstream ios::in
- ofstream ios::out
- fstream ios::in | ios::out

Opening a File

We can combine the different modes using or symbol | .

```
    ofstream new_file;
    new_file.open(“fileName.txt”,ios::out|ios::app)
```

Here, input mode and append mode are combined which represents the file is opened for writing and appending the outputs at the end.

Using a stream insertion operator << we can write information to a file and using stream extraction operator >> we can easily read information from a file.

Opening a File

```
#include<iostream>
#include<fstream>
using namespace std;
int main()
{
    fstream fileObject;
    fileObject.open("abc.txt",ios::out);
    if(!fileObject)
    {
        cout<<"File creation Failed"<<endl;
    }
    else{
        cout<<"New file Created"<<endl;
        fileObject.close();
    }
    return 0;
}
```

Read and Write

- To read a file we need to use ‘in’ mode with syntax ios::in and class would be ifstream
- To write to a file, we need to use ‘out’ mode with syntax ios::out and class would be ofstream
- To use bothe operations like read and write, we can use class fstream.
- we can print the content of the file from main memory to screen using extraction operator >> and we can write content from main memory to file using << insertion operator.

Read Operation

```
#include<iostream>
#include<fstream>
using namespace std;
int main()
{   char name[20];
    ifstream infile;
    infile.open("abc.txt",ios::in);
    cout<<"Reading from file :"<<endl;
    infile>>name;
    cout<<name;
    infile.close();
    return(0);
}
```

Write Operation

```
#include<iostream>
#include<fstream>
using namespace std;
int main()
{   char name[20];  ofstream outfile;
    outfile.open("abc.txt",ios::out);
    cout<<"Enter your name : ";    cin>>name;
    outfile<<name;
    outfile.close();
    return(0);
}
```

Read and Write

```
#include<iostream>
#include<fstream>
using namespace std;
int main()
{   char name[20];  ofstream outfile;
    outfile.open("abc.txt",ios::out);
    cout<<"Enter your name : ";    cin>>name;
    outfile<<name;
    outfile.close();
    ifstream infile;
    infile.open("abc.txt",ios::in);
    cout<<"Reading from file :"<<endl;
    infile>>name;
    cout<<name;
    infile.close();
    return(0);
}
```