Fundamentals of Programming: Pointers in C++

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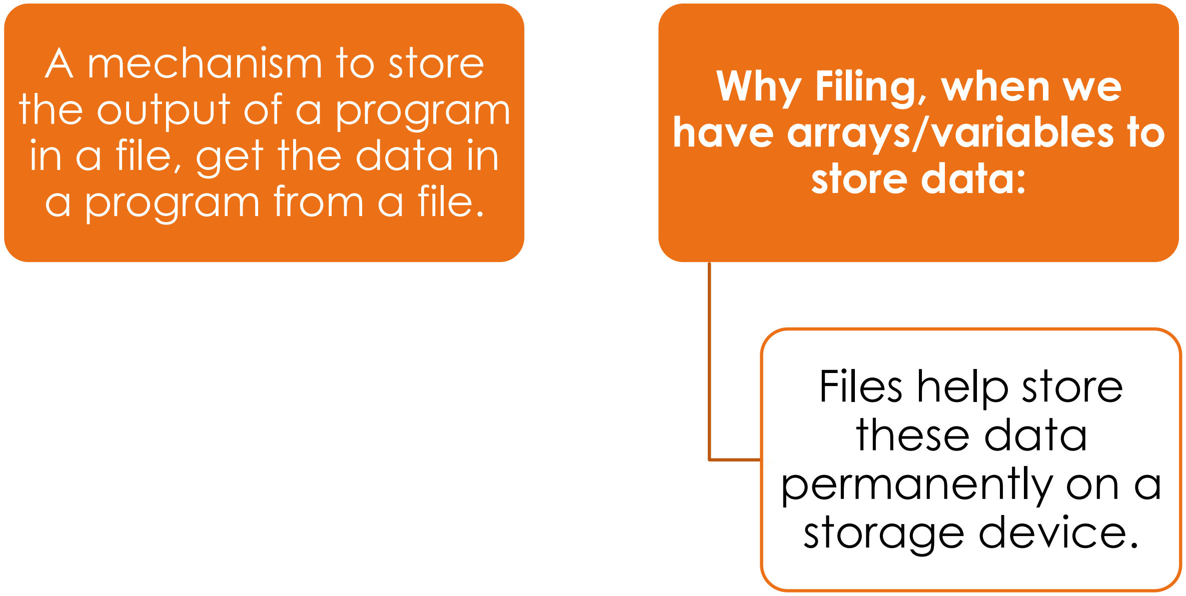
Agenda

- Address Operator
- Definition of a pointer
- Syntax of a pointer
- Creating pointer variables and accessing those
- Use of Dereference Operator
- Pointer to Pointer
- Pointer Arithmetic (Increment/Decrement)

What is a file?

- Unit of stored data that is identifiable by a unique name and stored in a filesystem.
- It can contain various types of information, such as text, images, videos, executable code, or any other form of data.
- Files can be of various types, but we will work with text files.

File Handling



A mechanism to store the output of a program in a file, get the data in a program from a file.

Why Filing, when we have arrays/variables to store data:

Files help store these data permanently on a storage device.

Stream:

- Stream means flow of data, data can flow from console to the execution program, and from execution program to the console.

Fstream

- Header file, which gives access to file handling methods in C++
- Three classes of fstream:
  - ofstream
  - ifstream
  - fstream

fstream library

ofstream:

Helps to write data to the file, also known as output stream

ifsream:

Helps to read data from the file, also called input stream

fstream:

Combination of ifstream and ofstream, provides capability of reading and writing a file

File operations in C++

1

open() – This is used to open/create a file.

2

read() – This is used to read the data from the file.

3

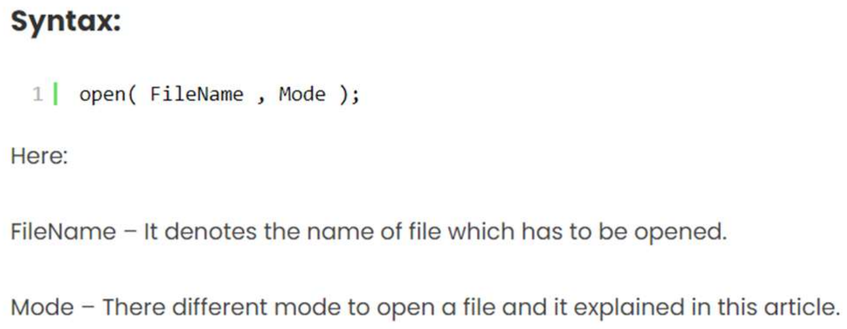
write() – This is used to write new data to file.

4

close() – This is used to close the file.

Opening a file

- To read or enter data to a file, we need to open it first.



Syntax:

```
open( FileName , Mode );
```

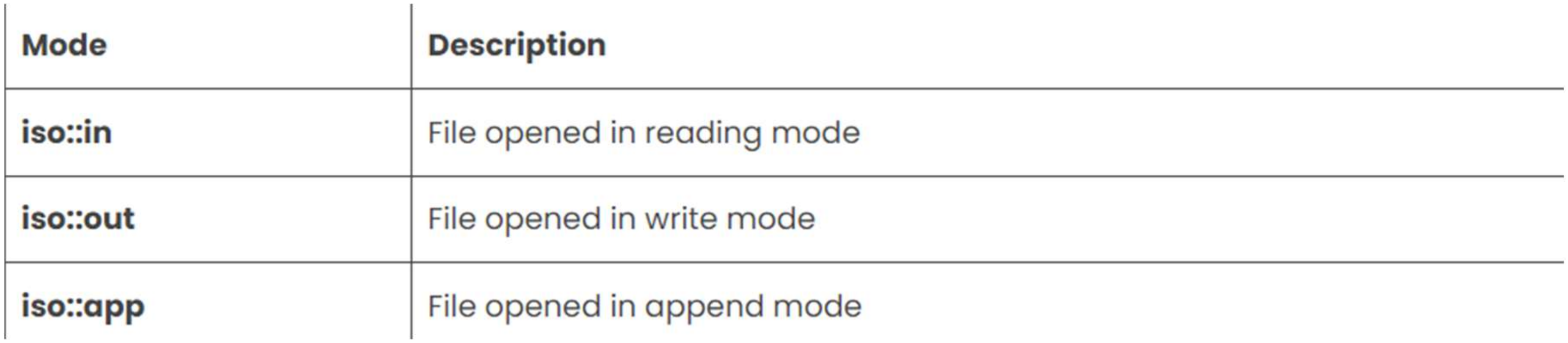
Here:

FileName – It denotes the name of file which has to be opened.

Mode – There different mode to open a file and it explained in this article.

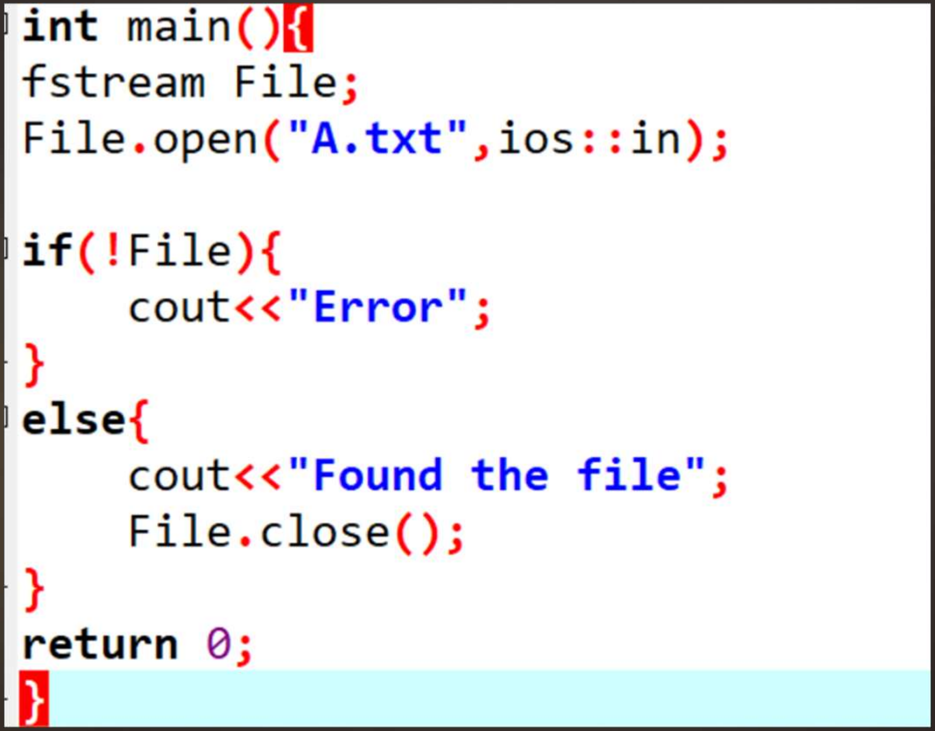
Modes for a file

THIS IS IOS NOT ISO



Mode	Description
iso::in	File opened in reading mode
iso::out	File opened in write mode
iso::app	File opened in append mode

Code for opening a file

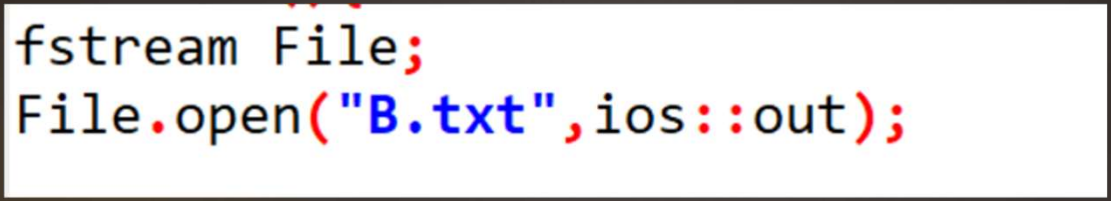


```
int main(){
fstream File;
File.open("A.txt",ios::in);

if(!File){
    cout<<"Error";
}
else{
    cout<<"Found the file";
    File.close();
}
return 0;
}
```

Explanation of the code

1. We have a fstream library, which is responsible for handling files.
2. Creating an object of the fstream class and named it as ‘File’.
3. On the above-created object, we have to apply the open() function to create a new file, and the mode is set to ‘out’ which will allow us to write into the file.
4. We use the ‘if’ statement to check for the file creation.
5. Prints the message to console if the file doesn’t exist.
6. Prints the message to console if the file exists/created.
7. We use the close() function on the object to close the file.

Code for creating a file



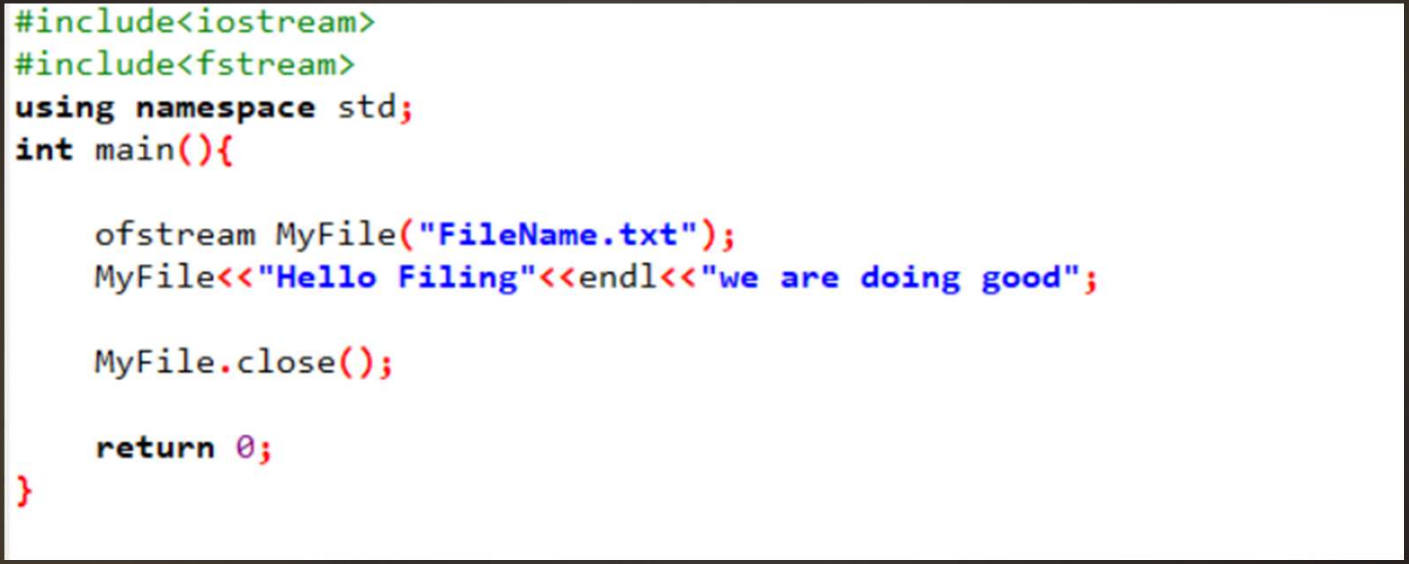
```
fstream File;
File.open("B.txt",ios::out);
```

Writing to a file

- We will use stream insertion operator (<<) along with the text enclosed within the double-quotes.

- With open() function, we will create a new file named ‘FileName’ and then we will set the mode to ‘ios::out’ as we have to write the data to file

Code for writing the data

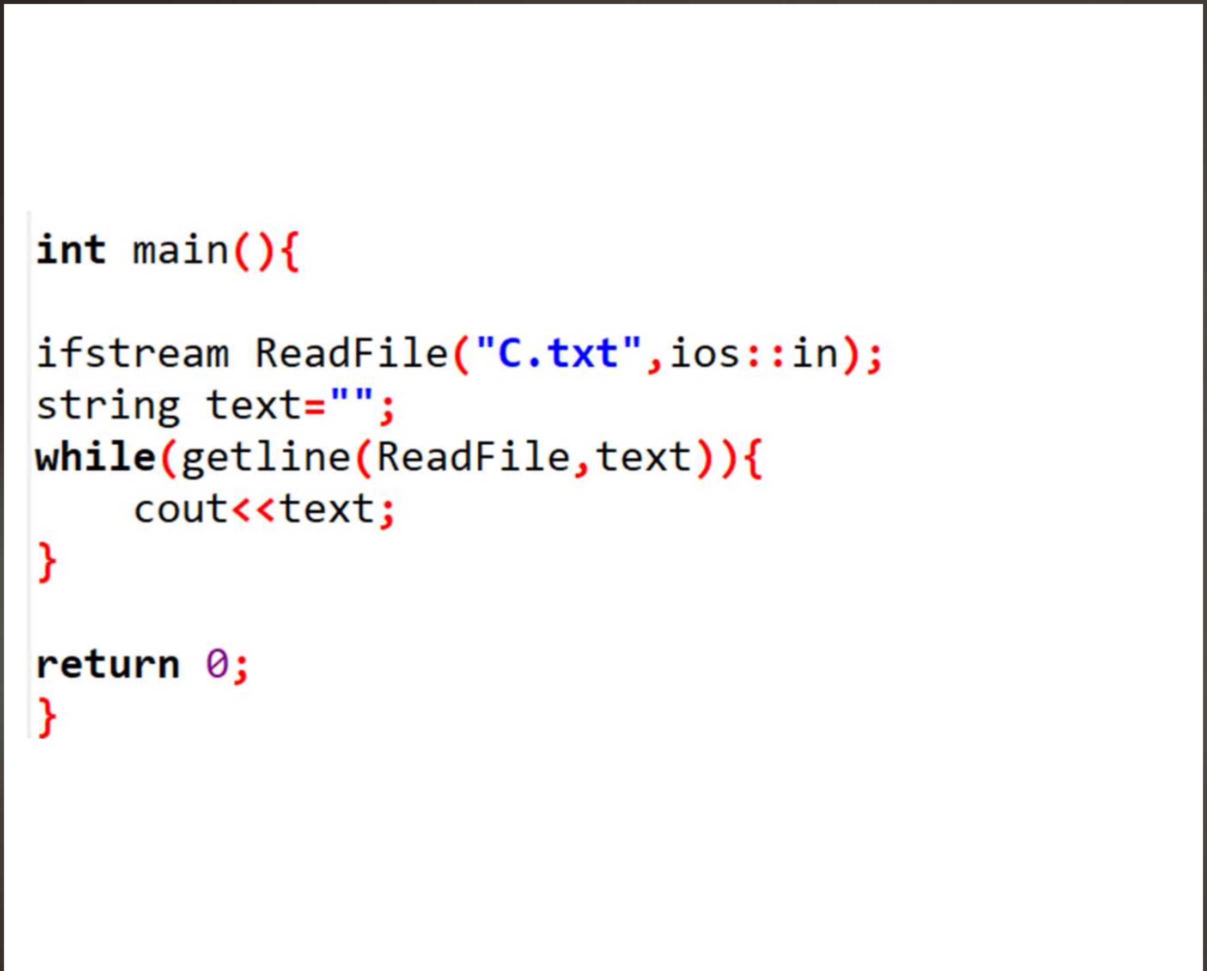


```
#include<iostream>
#include<fstream>
using namespace std;
int main(){

    ofstream MyFile("FileName.txt");
    MyFile<<"Hello Filing"<<endl<<"we are doing good";

    MyFile.close();

    return 0;
}
```

Reading data from a file

- For reading the data from a file, we will have to assure that file must exist
- We will open the file in ios:in mode

Code for Reading the data



```
int main(){

ifstream ReadFile("C.txt",ios::in);
string text="";
while(getline(ReadFile,text)){
    cout<<text;
}

return 0;
}
```

Writing an array to the file

Reading from file to array

Tasks

- Write code for writing to the file named MyFile.txt, with the help of ofstream.
- Write following message: “There are no secrets to success”

Tasks

Create a function which takes an array of employee names as its parameter

The function stores each element of the array on a new line of the file named Emp_names.txt