Reading from a File

Revision: Writing in File

Storing output in the file is a five-step process:

1. Include the header file fstream in the program.
2. Declare file stream variables.
3. Associate the file stream variables with the text file and define the opening mode.
4. Use the file stream variables insertion operator << (to store output in the file i.e., write in the file)
5. Close the file.

Revision

Write a C++ Program to store "Welcome to UET" in a text file.

```
#include <fstream>
using namespace std;
main()
{
    string line = "Welcome to UET";
    fstream newFile;
    newFile.open("TextFile.txt", ios::out);
    newFile << line;
    newFile.close();
}
```

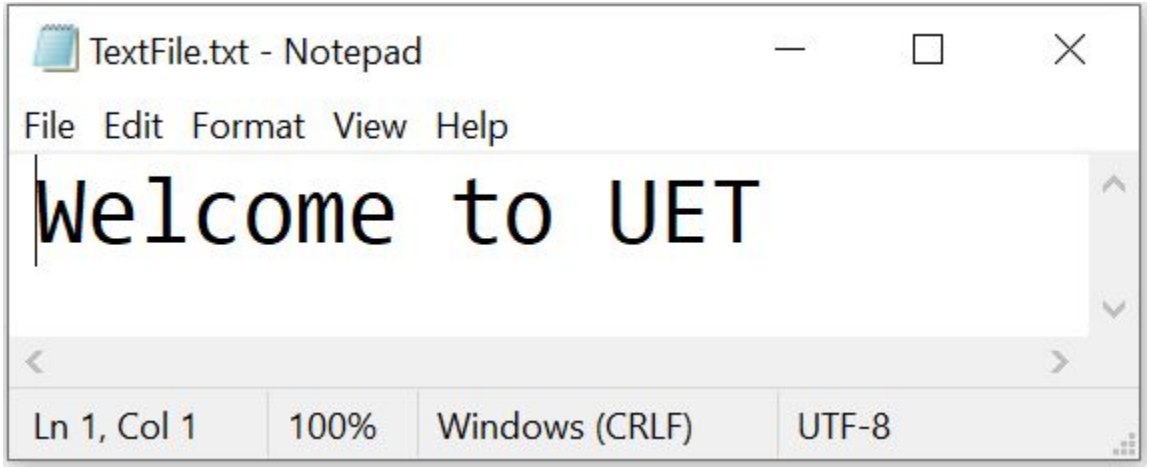
File Stream: Reading from a File

Taking input from the file is also a five-step process:

1. Include the header file fstream in the program.
2. Declare file stream variables.
3. Associate the file stream variables with the text file and define the opening mode.
4. Use the file stream variables with extraction operator >> (to take input from the file i.e., read the file).
5. Close the file.

Working Example

Write a C++ Program to read "Welcome to UET" from a text file and show it on the console.



Working Example

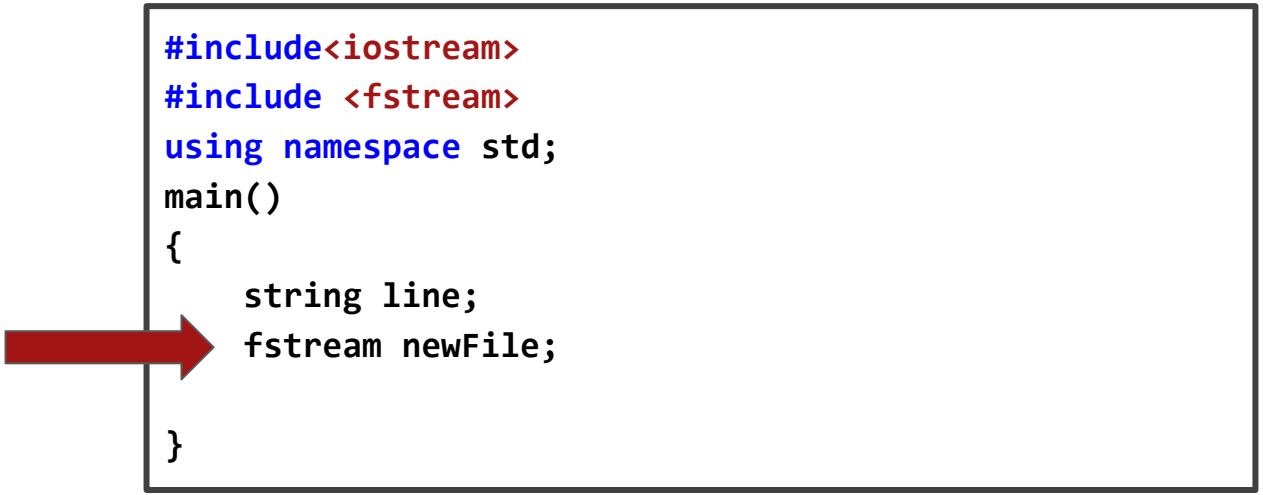
Step 1: Include the header file fstream in the program.

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


}
```

Working Example

Step 2: Declare file stream variable to open the file.

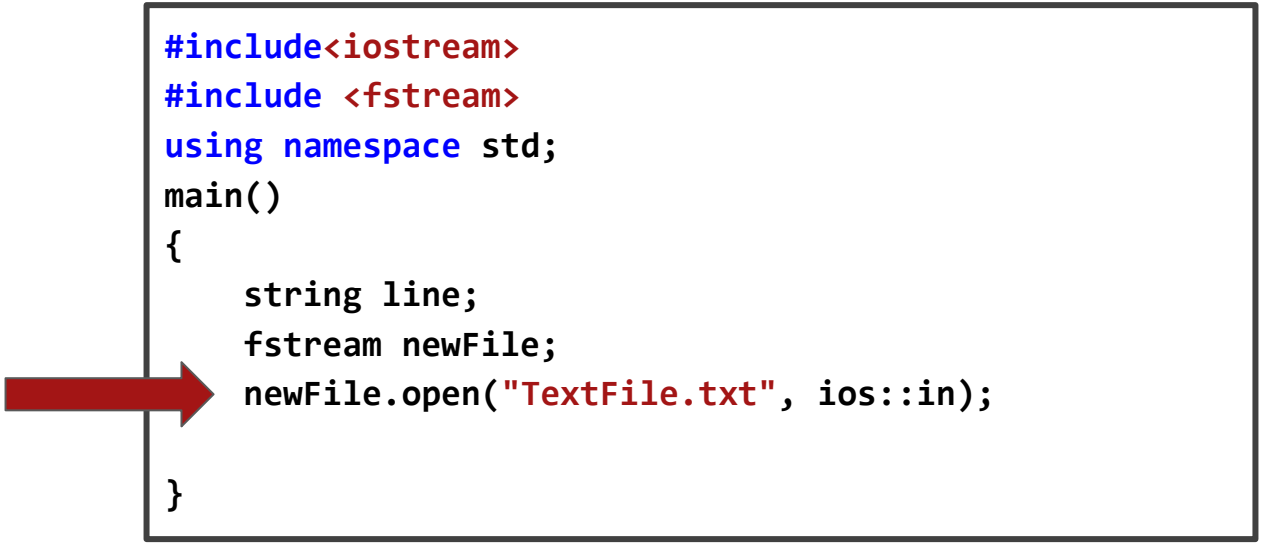


```
#include<iostream>
#include <fstream>
using namespace std;
main()
{
    string line;
    fstream newFile;

}
```

Working Example

Step 3: Associate the file stream variables with the text file and define the opening mode.

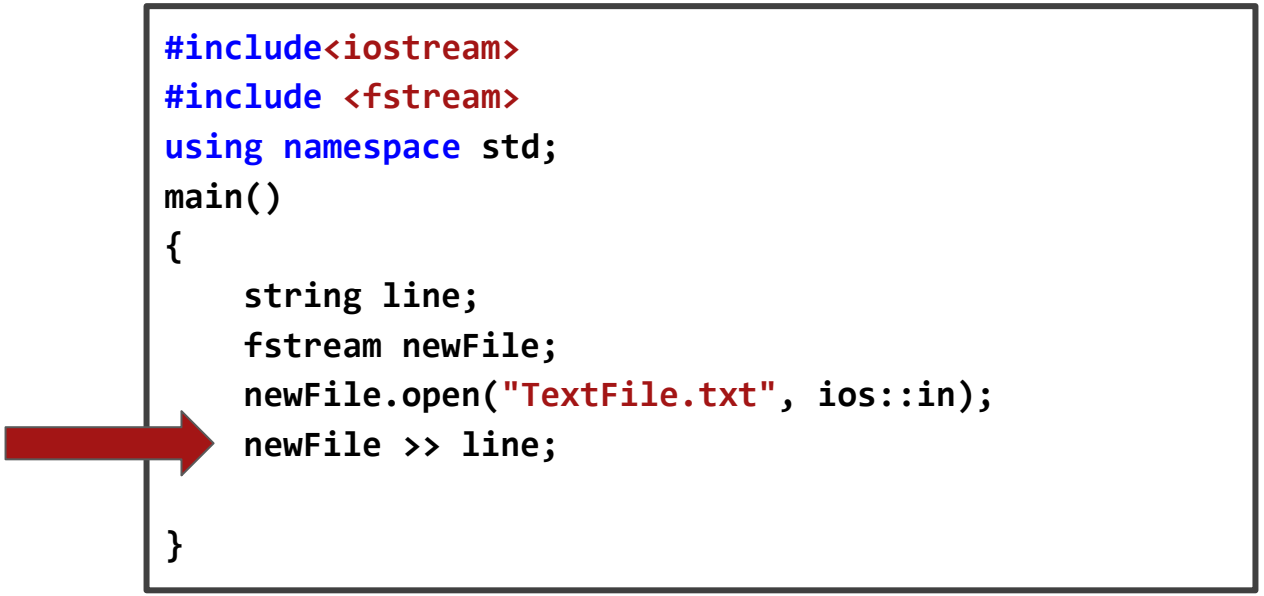


```
#include<iostream>
#include <fstream>
using namespace std;
main()
{
    string line;
    fstream newFile;
    newFile.open("TextFile.txt", ios::in);

}
```

Working Example

Step 4: Use the file stream variables extraction operator >> (to read from the file).



```
#include<iostream>
#include <fstream>
using namespace std;
main()
{
    string line;
    fstream newFile;
    newFile.open("TextFile.txt", ios::in);
    newFile >> line;

}
```

Working Example

Step 5: Close the file.

```
#include<iostream>
#include <fstream>
using namespace std;
main()
{
    string line;
    fstream newFile;
    newFile.open("TextFile.txt", ios::in);
    newFile >> line;
    newFile.close();

}
```

Working Example

Display output on the Console.

```
#include<iostream>
#include <fstream>
using namespace std;
main()
{
    string line;
    fstream newFile;
    newFile.open("TextFile.txt", ios::in);
    newFile >> line;
    newFile.close();
    cout << line;
}
```

Working Example: Output

Output on the Console is:

```
C:\C++>c++ program.cpp -o program.exe

C:\C++>program.exe
Welcome
C:\C++>
```

Working Example: Output

Can anyone tell why we only got "Welcome" instead of "Welcome to UET"?

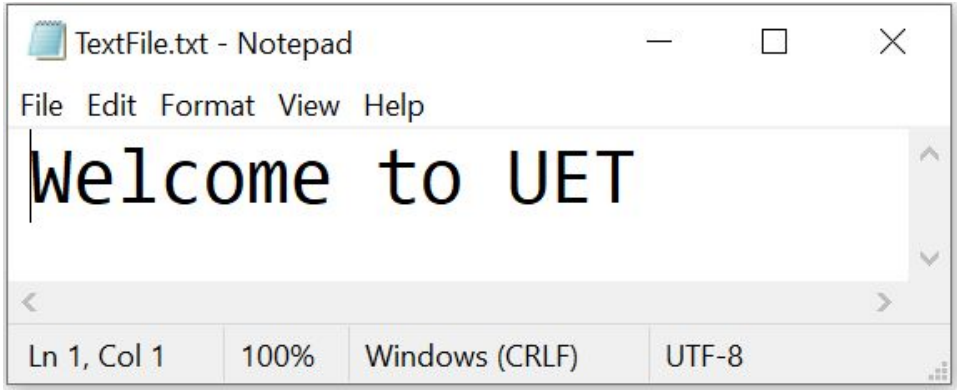
```
C:\C++>c++ program.cpp -o program.exe

C:\C++>program.exe
Welcome
C:\C++>
```

Working Example: Output

It reads only 1 word from the file until cursor reaches a blank space. Following program will only print "Welcome"

```
#include<iostream>
#include <fstream>
using namespace std;
main()
{
    string line;
    fstream newFile;
    newFile.open("TextFile.txt", ios::in);
    newFile >> line;
    newFile.close();
    cout << line;
}
```



Working Example: Output

What we have to do to read the complete line?

```
#include<iostream>
#include <fstream>
using namespace std;
main()
{
    string line;
    fstream newFile;
    newFile.open("TextFile.txt", ios::in);
    newFile >> line;
    newFile.close();
    cout << line;
}
```

Working Example: Output

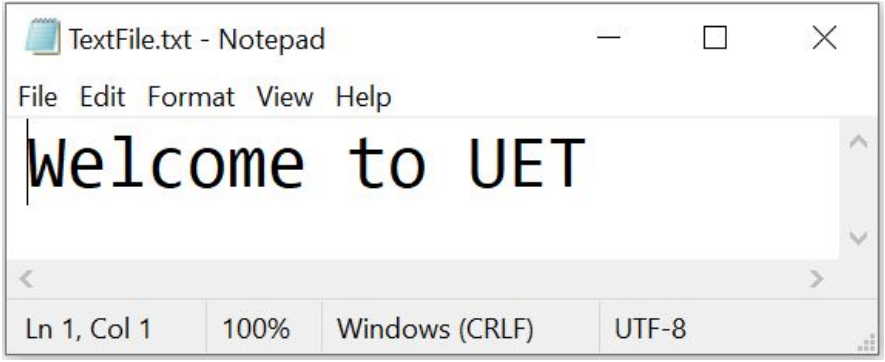
We have to use getline(file_variable, string_variable) function.

```
#include<iostream>
#include <fstream>
using namespace std;
main()
{
    string line;
    fstream newFile;
    newFile.open("TextFile.txt", ios::in);
    newFile >> line;
    newFile.close();
    cout << line;
}
```

Working Example: Output

Following code will print "Welcome to UET" on the screen

```
#include<iostream>
#include <fstream>
using namespace std;
main()
{
    string line;
    fstream newFile;
    newFile.open("TextFile.txt", ios::in);
    getline(newFile, line);
    newFile.close();
    cout << line;
}
```



Working Example: Output

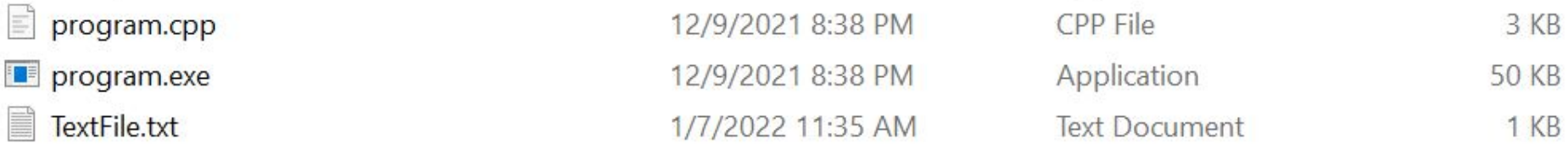
Output on the Console is:

```
C:\C++>c++ program.cpp -o program.exe

C:\C++>program.exe
Welcome to UET
C:\C++>
```

File in the Same Directory

Important thing to note here is that the .txt file we are reading is in the same directory as that of our .cpp file.



program.cpp	12/9/2021 8:38 PM	CPP File	3 KB
program.exe	12/9/2021 8:38 PM	Application	50 KB
TextFile.txt	1/7/2022 11:35 AM	Text Document	1 KB

Reading all the contents from File

How to read all the names from the file and print on the console?

Reading all the contents from File

Now, we want to read the file until it reaches the end of file.

For that we have a function **eof()**.

Syntax to use that function is:

```
file_variable.eof()
```

Reading all the contents from File

How to read all the names from the file and print on the console?

```
fstream file;
file.open("data.txt", ios::in);
string line;
while (!file.eof())
{
  getline(file, line);
  cout << line << endl;
}
file.close();
```

Learning Objective

Write **C++ Program** that reads permanently stored data from the text file.

Conclusion

- Taking input from the file is also a five-step process:

1. Include the header file fstream in the program.
2. Declare file stream variables.
3. Associate the file stream variables with the text file and define the opening mode.
4. Use the file stream variables with extraction operator >> (to take input from the file i.e., read the file).
5. Close the file.

Conclusion

- file_variable >> only reads a single word from the file.
- getline(file_variable, string_variable) is used to read a complete line from the user.
- file_variable.eof() returns non-zero (true) when the cursor reaches end of the file, otherwise it returns zero.

Self Assessment

1. Develop a SigIn and SignUp Application using File System.

- As a user, when I signup to the system the username and password stores into the file.

- As a user, when I signin to the system the username and password is verified from the file.

Self Assessment

Input

students.txt - Notepad

File Edit Format View Help

```
John
123
76
Jane
231
92
Smith
421
65
```

Ln 10, Col

Self Assessment

2. A file "students.txt" has data stored like this on separate lines

   Admission_number
   Name
   Percentage.

Write a function read_rec() in c++ that reads contents of the file "student.txt" and then write a function write_rec() that stores the details of those students whose percentage is above 75 in descending order in a separate file named "topperStudents.txt".

Self Assessment

Output

topperStudents.txt - Notepad

File Edit Format View Help

```
Name: Jane
Admission Number: 231
Percentage: 92

Name: John
Admission Number: 123
Percentage: 76
```

Ln 9, Col 1