LP104 Object-Oriented Programming
Lab 11 – File Input/Output

In this lab, you are required to complete the following tasks. Your programs must pass the compilation and testing.

Tasks

Q1. File reading

Given an input file named "**`lab11-T1.txt`**" with the following format:

- 3 data per line;
- 1st data: an integer;
- 2nd data: a real number;
- 3rd data: a name (a string which may contain spaces).

```
1234 10.0 Steve Mark
2345 11.0 Tai Man Chan
8938 17.5 Keith Morrison
4521 35.6 Mark Selby
6169 89.9 Hon Man Wong
7756 23.5 Chi Nin Tang
```

How can you read data from a file with the following format? Please write a program to read this file and output the result as follows:

Sample output:

```
Steve Mark 1234 10.0
Tai Man Chan 2345 11.0
Keith Morrison 8938 17.5
Mark Selby 4521 35.6
Hon Man Wong 6169 89.9
Chi Nin Tang 7756 23.5
```

Hint:

You may need to check whether the open of the input file is successful or failure by method **`fail()`**.

Q2. HTML Convert

HTML files use tags enclosed in angle brackets to denote formatting instructions. For example, <B> indicates bold, <I> indicates italics, etc. If a web browser is displaying an HTML document that contains < or > then it may mistake these symbols for tags. This is a common problem with C++ files, which contain many <'s and >'s. For example, the line "**`#include <iostream>`**" may result in the browser interpreting <**`iostream`**> as a tag.

To avoid this problem, HTML uses special symbols to denote < and >. The < symbol is created with the string **`<`** while the > symbol is created with the string **`>`**

Write a program that reads in a C++ source file and converts all < symbols to < and all > symbols to > . Also add the tag <PRE> to the beginning of the file and </PRE> to the end of the file. This tag preserves whitespace and formatting in the HTML document. Your program should output the HTML file to disk.

As an example, given the following input file ("**t2_input1.cpp**")

```
#include <iostream>
using namespace std;

int funtion()
{
      int x=4;
      if (x < 3) x++;
      cout << x << endl;
      return 0;
}
```

The program should produce a textfile with the following contents:

```
<PRE>
#include &lt;iostream&gt;
using namespace std;

int funtion()
{
      int x=4;
      if (x &lt; 3) x++;
      cout &lt;&lt; x &lt;&lt; endl;
      return 0;
}</PRE>
```

You can test your output file by opening it with a web browser. The contents should appear identical to the original source code.

Hint and Requirement:

- You may use **get()** to read a character by character from the file;
- Your program shall give an error message with failing to open an input file;
- Do not write hardcode (I will check your program with other testing cases).

Sample1

```
Task2: Html Convertor
Input your filename:
tt.txt
Task 2:
I/O failure opening file.
```

Sample2

```
Task2: Html Convertor
Input your filename:
t2_input1.cpp
Task 2:
Conversion done.  Results in file t2_input1.cpp.html
```

Bonus question

Can you revise the code of your task 2 so that it can convert the C++ source files to html files with colors.

For example, you shall use blue color to display the keywords, **red** color to display directives and constant string and green color to display the comments.

```
#include <iostream>
using namespace std;

/*****************************
  there is the main program
*****************************/

int main()
{
  //some code
  int x=4;
  if (x < 3) x++;
  cout << "x:" << x << endl;
  return 0;
}
```