Lab Hand-out 3

Basic Input/Output

cin and Strings

However, cin extraction always considers spaces (whitespaces, tabs, new-line...) as terminating the value being extracted, and thus extracting a string means to always extract a single word, not a phrase or an entire sentence.

```
string mystring;
cin >> mystring;
```

To get an entire line from cin, there exists a function, called getline, that takes the stream (cin) as first argument, and the string variable as second. For example:

```
// cin with strings
#include <iostream>
#include <string>
using namespace std;

int main ()
{
  string mystr;
  cout << "What's your name? ";
  getline (cin, mystr);
  cout << "Hello " << mystr << ".\n";
  cout << "What is your favorite team? ";
  getline (cin, mystr);
  cout << "I like " << mystr << " too!\n";
  return 0;
}
```

```
What's your name? Homer Simpson
Hello Homer Simpson.
What is your favorite team? The Isotopes
I like The Isotopes too!
```

Notice how in both calls to getline, we used the same string identifier (mystr). What the program does in the second call is simply replace the previous content with the new one that is introduced.

Stringstream

The standard header <sstream> defines a type called stringstream that allows a string to be treated as a stream, and thus allowing extraction or insertion operations from/to strings in the same way as they are performed on cin and cout. This feature is most useful to convert strings to numerical values and vice versa. For example, in order to extract an integer from a string we can write:

```
string mystr ("1204");
int myint;
stringstream(mystr) >> myint;
```

This declares a string with initialized to a value of "1204", and a variable of type int. Then, the third line uses this variable to extract from a stringstream constructed from the string. This piece of code stores the numerical value 1204 in the variable called myint.

```
// stringstreams
#include <iostream>
#include <string>
#include <sstream>
using namespace std;

int main ()
{
  string mystr;
  float price=0;
  int quantity=0;

  cout << "Enter price: ";
  getline (cin,mystr);
  stringstream(mystr) >> price;
  cout << "Enter quantity: ";
  getline (cin,mystr);
  stringstream(mystr) >> quantity;
  cout << "Total price: " << price*quantity << endl;
  return 0;
}
```

```
Enter price: 22.25
Enter quantity: 7
Total price: 155.75
```

In this example, we acquire numeric values from the standard input indirectly: Instead of extracting numeric values directly from cin, we get lines from it into a string object (mystr), and then we extract the values from this string into the variables price and quantity. Once these are numerical values, arithmetic operations can be performed on them, such as multiplying them to obtain a total price.

With this approach of getting entire lines and extracting their contents, we separate the process of getting user input from its interpretation as data, allowing the input process to be what the user expects, and at the same time gaining more control over the transformation of its content into useful data by the program.

Task

Write a program in C++ to create a database of a student's credentials and check whether the primitive values crossing the limits or not and display them using appropriate spaces and arrangements.

Credentials:

Name: Entered name must be displayed

Gender: M for male and F for female, error message must be generated if entered value is other than M and F.

Date of Birth: Day, Month and year should lie with valid ranges e.g. Day is between 1 and 31, Month is between 1 and 12 and year between 2000 and 2005, error message must be generated otherwise.

Intermediate Percentage: Error message must be generated if entered value is below zero or more than 100.

Intermediate Majors: Pre-engineering or Computer. Error message must be generated if entered value is other than Pre-engineering and Computer.

Joining Semester: Two parts i.e. (SP or FA for Spring or Fall) and year (20, 21 etc.). Two inputs must be taken and displayed without any spaces e.g. FA21 (which is your batch). Error message must be generated if entered value is other than SP and FA.

After data entry, your program will display “Entered Data is as follows:” after which your credentials will be displayed one after the other in any arrangement/spaces seems appropriate to you.