ECE2036: Week1_B – I/O Manipulator and Sequential File I/O

Today we will continue to discuss the concept of basic I/O to the terminal screen and keyboard input. We will talk about some basic I/O manipulators that we can add to the instruction stream to format the output. You will need to include a new library.

#include <iomanip>

These manipulators can be put into the instruction stream for cout, for example.

cout << setw(15) << "Hello" << endl;

Using text files to store or read in data to your programs is extremely useful. We will look at a couple of basic examples. The syntax to declare file objects:

#include <fstream>

ifstream inFileExample("filename.txt", ios::in); //constructor to have an input file object

ofstream outFileExample("filename.txt," ios::out); //This will destroy file.. you can use ios::app to append data

Use << or >> operator to read or write in data just like cout and cin. Notice the use of the member function close() to close the file.

```
1   //---------------------------------------- Example 1
2   #include <iostream>
3   #include <iomanip>
4   using namespace std;

5   int main()
6   {
7   cout << "Hello" << endl;
8   cout << setw(15) << "Hello" << endl;
9   cout << "Hello" << endl;
10  cout << setw(15) << "Hello" << "Hello" <<endl;

11  //example of sticky

12  cout << setfill('*');
13  cout << setw(15) << "Hello" << endl;
14  cout << setw(30) << "Hello" << endl;
15  return 0;

16  }

17  //---------------------------------------- Example 2

18  #include <iostream>
19  #include <iomanip>
20  using namespace std;

21  int main()
22  {
23  int intValue; // notice the use of camel style
24  float floatValue;

25  cout << "Input an integer: ";
26  cin >> intValue;
```

```
27  //now output the number
28  cout << "The value you entered in hex is: " << hex << intValue << endl;
29  cout << dec; // remove temporarily to show it is sticky

30  cout << " The value in decimal is: " << intValue << endl;
31  cout << "Input a float number: ";
32  cin >> floatValue;
33  cout << setprecision(2);
34  cout << scientific << "The float value with scientific: " << floatValue << endl;
35  cout << fixed << "The float value with fixed is: " << floatValue << endl;

36  return 0;

37  }

38  //---------------------------------------- Example 3
39  #include <iostream>
40  #include <fstream>
41  using namespace std;

42  int main()
43  {
44  ofstream outputFileExample("output.txt", ios::out);
45  //ios::out deletes current contents of files
46  //ios::app this will append to the file

47  int number = 10;

48  outputFileExample << "Hello File!!" << endl;
49  outputFileExample << number << endl;

50  outputFileExample.close();  //This is an interesting function call that
51  // we have not cover yet...

52  return 0;
53  }

54  //---------------------------------------- Example 4

55  #include <iostream>
56  #include <fstream>
57  using namespace std;

58  int main()
59  {
60  ifstream inFileExample("input.txt", ios::in);
61  int x;
62  int y;
63  bool goodInput;

64  //checking to see if we opened the file
65  if (inFileExample == false) //note that we could also use -- if (!inFileExample)
66  cout << "Error in opening the file" << endl;
67  else
68  {
69  inFileExample >> x >> y;
70  goodInput = inFileExample;
71  while (goodInput) //first use of a while loop like in MATLAB
72  {
73  cout << "x = " << x << " y = " << y << endl;
74  goodInput = inFileExample >> x >> y; // notice combination
75  }

76  }

77  inFileExample.close(); //This closes the file object
78  }
```