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Lab Session 3

Lab 3.1

(3 points) Exercise 1: Retrieve `bill.cpp` and fill in the code as instructed by the lab manual. Make sure your completed program produces the output shown in the example. Attach the completed program printout for exercise 1.

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

int main() {

    int quantity;          // contains the amount of items purchased
    float itemprice;       // contains the price of each time
    float totalBill;       // contains the total bill

    cout << setprecision(2) << fixed << showpoint; //formated output
    cout << "Please input the number of items bought " << endl;

    cin >> quantity;
    cout << "Please input the price of each time " << endl;

    cin >> itemprice;
    totalBill = quantity * itemprice;

    cout << "The total bill is " << totalBill << endl;


    system("pause>0");
    return 0;
}
```

```
E:\Study Materials\C++\Death note\x64\Debug\Death note.exe
Please input the number of items bought
22
Please input the price of each time
10.98
The total bill is 241.56
```

(1 point) Exercise 2: Record the output of Total Bill after removing the `fixed` attribute in the `cout` statement: **2.4e+002**

(1 point) Exercise 3: Record the output of Total Bill after replacing the `fixed` attribute, and changing the `setprecision(2)` attribute to `setprecision(4)`: **$241.5600**

(2 points) Write your observations about the `setprecision()` attribute:

The set precision() method allows the integer to increase the number after the decimal point with this method it's up to the user how much number he wants to precise

Lab 3.2

(3 points) Exercise 1: Retrieve `tabledata.cpp` and fill in the code as instructed by the lab manual. Make sure your completed program produces the output shown in the example. Attach the completed program printout for exercise 1.

```cpp
#include <iostream>
#include <iomanip>

using namespace std;

int main() {

    float price1, price2; // The price of 2 items
    int quantity1, quantity2; // The quantity of 2 items

    cout << setprecision(2) << fixed << showpoint;
    cout << "Please input the price and quantity of the first item" << endl;

    cin >> quantity1 >> price1;
    cout << "Please input the price and quantity for the first time " << endl;

    cin >> quantity2 >> price2;
    cout << setw(15) << "PRICE" << setw(12) << "QUANTITY" << endl;

    cout << setw(15) << price1 << setw(12) << quantity1 << endl;
    cout << setw(15) << price2 << setw(12) << quantity2 << endl;

    system("pause>0");
    return 0;
}
```

```
E:\Study Materials\C++\Death note\x64\Debug\Death note.exe
Please input the price and quantity of the first item
8 1.95
Please input the price and quantity for the first time
9 10.89
          PRICE    QUANTITY
           1.95          8
          10.89          9
```

Lab 3.3

(3 points) Exercise 1: Retrieve `righttrig.cpp` and fill in the code as instructed by the lab manual. Make sure your completed program produces the output shown in the example. Attach the completed program printout for exercise 1.

```cpp
1   // This program will input the value of two sides of a right triangle and then
2   // determine the size of the hypotenuse.
3   // Musadique Hussain
4
5   #include <iostream>
6   #include <cmath> // needed for math functions like sqrt()
7
8
9   using namespace std;
10
11  int main()
12  {
13      float a, b; // the smaller two sides of the triangle
14      float hyp; // the hypotenuse calculated by the program
15
16      cout << "Please input the value of the two sides" << endl;
17      cin >> a >> b;
18      // Fill in the assignment statement that determines the hypotenuse
19
20      hyp = sqrt(a * a + b * b);
21
22      cout << "The sides of the right triangle are " << a << " and " << b << endl;
23      cout << "The hypotenuse is " << hyp << endl;
24      system("pause>0");
25      return 0;
```

```
E:\Study Materials\C++\Death note\x64\Debug\Death note.exe
Please input the value of the two sides
9 3
The sides of the right triangle are 9 and 3
The hypotenuse is 9.48683
```

(3 points) Exercise 2: Alter `righttrig.cpp` so your program produces the output shown in the example. You must include another directive and use formatting procedures to produce the sample output. Attach the completed program printout for exercise 2.

```cpp
1   // This program will input the value of two sides of a right triangle and then
2   // determine the size of the hypotenuse.
3   // Musadique Hussain
4
5   #include <iostream>
6   #include <cmath> // needed for math functions like sqrt()
7   #include <iomanip>
8
9   using namespace std;
10
11  int main()
12  {
13      float a, b; // the smaller two sides of the triangle
14      float hyp; // the hypotenuse calculated by the program
15
16      cout << "Please input the value of the two sides" << endl;
17      cin >> a >> b;
18      // Fill in the assignment statement that determines the hypotenuse
19
20      hyp = sqrt(a * a + b * b);
21
22      cout << "The sides of the right triangle are " << a << " and " << b << endl;
23      cout << "The hypotenuse is " << setprecision(3) << hyp << endl;
24      system("pause>0");
25      return 0;
```

3

```
E:\Study Materials\C++\Death note\x64\Debug\Death note.exe
Please input the value of the two sides
9 3
The sides of the right triangle are 9 and 3
The hypotenuse is 9.49
```

Lab 3.4

(1 point) Exercise 1: Run `batavg.cpp` and write the batting average before you made any modifications to the program: _____0_____

(1 point) Exercise 2: Write the batting average after changing the data type of batavg from `int` to `float`: _____0.292162_____

(3 points) Exercise 3: Attach printout of the corrected batavg.cpp program which will get 0.292162 as the result. Do not change the data type of the two named constants, but use typecast to solve the problem.

```cpp
1   // This program will determine the batting average of a player.
2   // The number of hits and at bats are set internally in the program.
3   // Musadique Hussain
4   #include <iostream>
5
6   using namespace std;
7   const int AT_BAT = 421;
8   const int HITS = 123;
9
10  int main()
11  {
12      float batAvg;
13      batAvg = HITS / AT_BAT; // an assignment statement
14      cout << "The batting average is " << static_cast<float>(HITS) / (AT_BAT);
15      system("pause>0");
16      return 0;
17  }
```

```
E:\Study Materials\C++\Death note\x64\Debug\Death note.exe
The batting average is 0.292162
```

Lab 3.5

(2 points) Exercise 1: Create a text file that contains the input data, and call it transaction.dat; save this in the same directory as your C++ program. Attach printout of the bill.out file that your C++ program has written.

```cpp
6    //Musadique Hussain
7
8    #include <iostream>
9    #include <fstream>
10   #include <iomanip>
11   using namespace std;
12
13   int main() {
14
15       ifstream dataIn;            //defines an input stream for a data file
16       ofstream dataOut;           //defines an output stream for an output file
17       int quantity;               //contains the amount of items purchased
18       float itemPrice;            //contains the price of each time
19       float totalBill;            //contains the totalbill, i.e the price of all time
20
21       dataIn.open("transaction.dat");         //This opens the file
22       dataOut.open("bill.out");
23
24       cout << setprecision(2) << fixed << showpoint;
25       cin >> quantity >> itemPrice;
26
27       totalBill = quantity * itemPrice;
28       cout << "The total bill is " << totalBill << endl;
29
30       return 0;
```

(3 points) Exercise 2: Attach printout of billfile.cpp that reads the transaction.dat file as input, and produces bill.out as output.

```
Select E:\Study Materials\C++\Death note\x64\Debug\Death note.exe
22
10.98
The total bill is 241.56
```

Lab 3.6 (Extra credit)

(2 points) Choose one of the three programming options, and attach printout of the program.

```cpp
1    #include <iostream>
2    #include <iomanip>
3    using namespace std;
4
5    int main() {
6
7        double grade1, grade2, grade3;
8        double sum, average;
9
10       cout << "Please input the first grade " << endl;
11       cin >> grade1;
12
13       cout << "Please input the second grade " << endl;
14       cin >> grade2;
15
16       cout << "Please input the third grade " << endl;
17       cin >> grade3;
18
19       sum = grade1 + grade2 + grade3;
20       average = sum / 3;
21
22       cout << "The average of three grades is " << setprecision(4) << average << endl;
23       system("pause>0");
24       return 0;
25
```

```
E:\Study Materials\C++\Death note\x64\Debug\Death note.exe
Please input the first grade
97
Please input the second grade
98.3
Please input the third grade
95
The average of three grades is 96.77
```