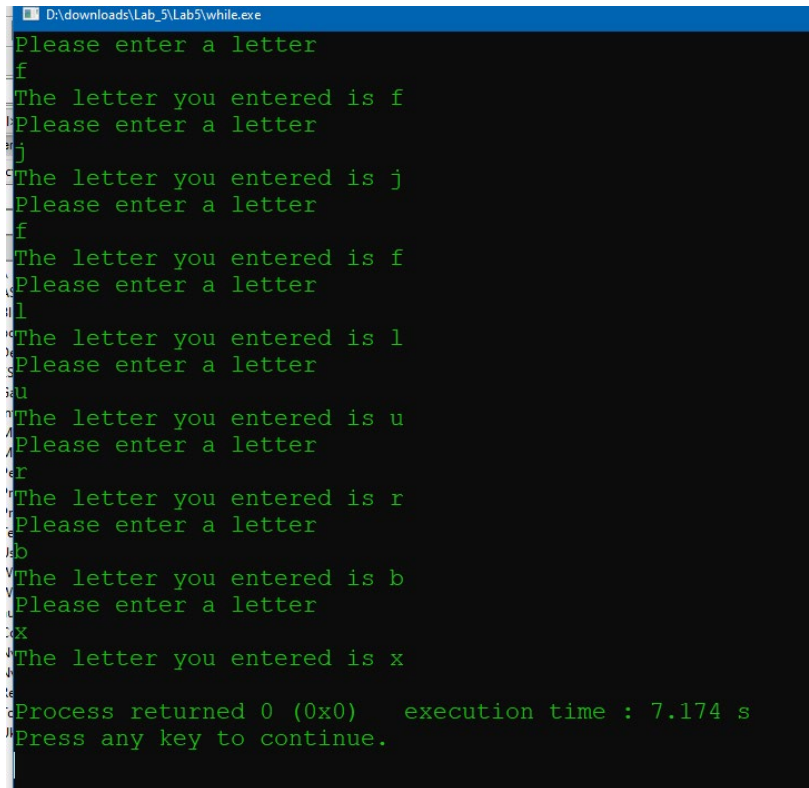


Jeremy Scheuerman

Dr. Peter Wang

Lab 5

5.1



```
D:\downloads\Lab_5\Lab5\while.exe
Please enter a letter
f
The letter you entered is f
Please enter a letter
j
The letter you entered is j
Please enter a letter
f
The letter you entered is f
Please enter a letter
l
The letter you entered is l
Please enter a letter
u
The letter you entered is u
Please enter a letter
r
The letter you entered is r
Please enter a letter
b
The letter you entered is b
Please enter a letter
x
The letter you entered is x
Process returned 0 (0x0) execution time : 7.174 s
Press any key to continue.
```

1.

The program doesn't tell you that you need to enter x to stop the loop

```
D:\downloads\Lab_5\Lab5\while.exe
If you enter the letter x program will end
Please enter a letter
h
The letter you entered is h
Please enter a letter
j
The letter you entered is j
Please enter a letter
sa
The letter you entered is s
Please enter a letter
The letter you entered is a
Please enter a letter
y
The letter you entered is y
Please enter a letter
u
The letter you entered is u
Please enter a letter
d
The letter you entered is d
Please enter a letter
x
The letter you entered is x

Process returned 0 (0x0)    execution time : 6.458 s
Press any key to continue.
```

2.

```
// PLACE YOUR NAME HERE

#include <iostream>
using namespace std;

int main()
{
    char letter = 'a';
    cout<<"If you enter the letter x program will end\n";

    do
    {
        cout << "Please enter a letter" << endl;
        cin >> letter;

        cout << "The letter you entered is " << letter << endl;
    }
    while (letter != 'x');
    return 0;
}
```

```
D:\downloads\Lab_5\Lab5\while.exe
If you enter the letter x program will end
Please enter a letter
g
The letter you entered is g
Please enter a letter
f
The letter you entered is f
Please enter a letter
d
The letter you entered is d
Please enter a letter
x
The letter you entered is x

Process returned 0 (0x0)   execution time : 6.109 s
Press any key to continue.
```

3.

Source Code

```
//Jeremy

#include <iostream>

using namespace std;

int main()
{
    char letter = 'a';

    cout<<"If you enter the letter x program will end\n";

    do
    {
        cout << "Please enter a letter" << endl;

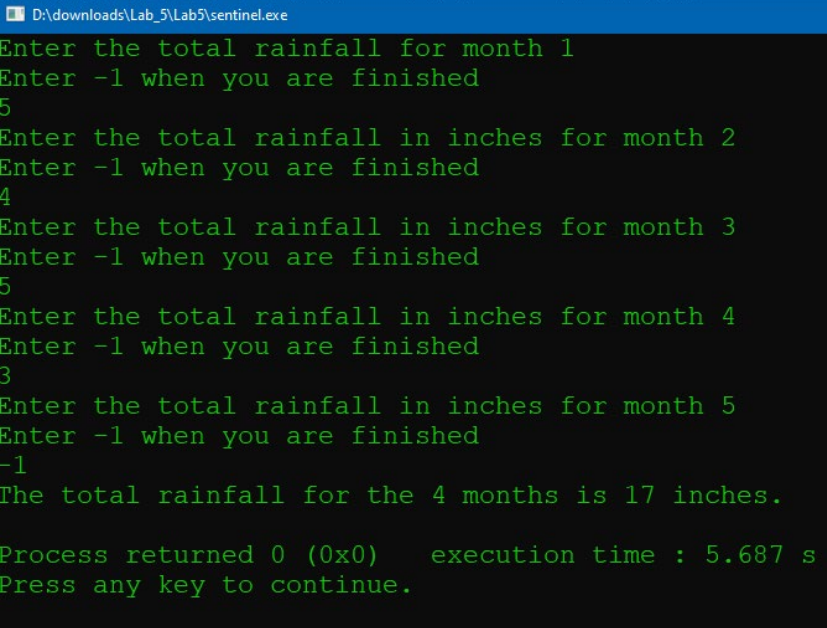
        cin >> letter;
```

```

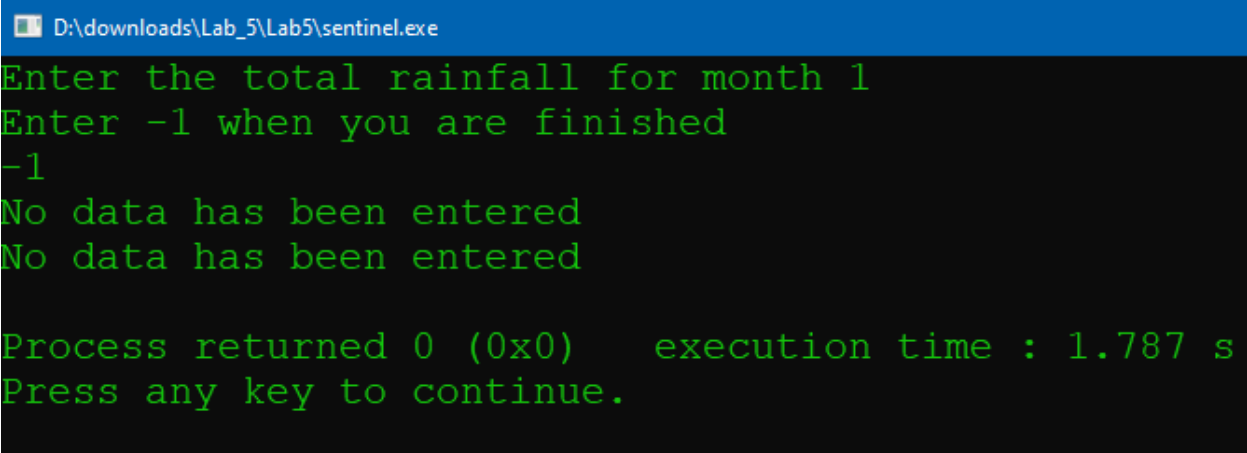
        cout << "The letter you entered is " << letter << endl;
    }
    while (letter != 'x');

    return 0;
}

```

4. 

5.



```
D:\downloads\Lab_5\Lab5\sentinel.exe
Enter the total rainfall for month 1
Enter -1 when you are finished
0
Enter the total rainfall in inches for month 2
Enter -1 when you are finished
6
Enter the total rainfall in inches for month 3
Enter -1 when you are finished
0
Enter the total rainfall in inches for month 4
Enter -1 when you are finished
0
Enter the total rainfall in inches for month 5
Enter -1 when you are finished
-1
The total rainfall for the 4 months is 6 inches.

Process returned 0 (0x0)    execution time : 10.427 s
Press any key to continue.
```

6. This code is to prevent the program from executing if no months have been entered

Source code

```
// This program illustrates the use of a sentinel in a while loop.
```

```
// The user is asked for monthly rainfall totals until a sentinel
```

```
// value of -1 is entered. Then the total rainfall is displayed.
```

```
// PLACE YOUR NAME HERE
```

```
#include <iostream>
```

```
using namespace std;
```

```
int main()
```

```
{
```

```
int month=1;

float total = 0, rain;


cout << "Enter the total rainfall for month " << month << endl;

cout << "Enter -1 when you are finished" << endl;

cin >>rain;

// Fill in the code to read in the value for rain


// Fill in the code to start a while loop that iterates

// while rain does not equal -1

while (rain!=-1)

{

    // Fill in the code to update total by adding it to rain

    total+=rain;

    // Fill in the code to increment month by one

    month+=1;

    cout << "Enter the total rainfall in inches for month "

    << month << endl;

    cout << "Enter -1 when you are finished" << endl;

    cin>>rain;

    // Fill in the code to read in the value for rain

}
```

```

if (month == 1)

    cout << "No data has been entered" << endl;

if (month == 1)

    cout << "No data has been entered" << endl;

else

    cout << "The total rainfall for the " << month - 1

        << " months is " << total << " inches." << endl;

return 0;

}

```

5.2

```

D:\downloads\Lab_5\Lab5\downhile.exe

Hot Beverage Menu
A: Coffee      $1.00
B: Tea   $ .75
C: Hot Chocolate    $1.25
D: Cappuccino   $2.50

Enter the beverage A,B,C, or D you desire
Enter E to exit the program
a
How many cups would you like?
5
The total cost is $ 6.00

Hot Beverage Menu
A: Coffee      $1.00
B: Tea   $ .75
C: Hot Chocolate    $1.25
D: Cappuccino   $2.50

Enter the beverage A,B,C, or D you desire
Enter E to exit the program

Enter the beverage A,B,C, or D you desire
Enter E to exit the program
B
How many cups would you like?
6
The total cost is $ 4.50

Hot Beverage Menu
A: Coffee      $1.00
B: Tea   $ .75
C: Hot Chocolate    $1.25
D: Cappuccino   $2.50

Enter the beverage A,B,C, or D you desire
Enter E to exit the program

```

1.

<pre> Enter the beverage A,B,C, or D you desire Enter E to exit the program c How many cups would you like? 3 The total cost is \$ 3.75 Hot Beverage Menu A: Coffee \$1.00 B: Tea \$.75 C: Hot Chocolate \$1.25 D: Cappuccino \$2.50 Enter the beverage A,B,C, or D you desire Enter E to exit the program </pre>	<pre> d How many cups would you like? 4 The total cost is \$ 10.00 Hot Beverage Menu A: Coffee \$1.00 B: Tea \$.75 C: Hot Chocolate \$1.25 D: Cappuccino \$2.50 Enter the beverage A,B,C, or D you desire Enter E to exit the program </pre>
--	---

2. Using another letter shows

```

Enter the beverage A,B,C, or D you desire
Enter E to exit the program
r
selection invalid Try again please

```

Using 2 letters starts an infinite loop

```

Enter the beverage A,B,C, or D you desire
Enter E to exit the program
a
How many cups would you like?
4
The total cost is $ 4.00

Hot Beverage Menu
A: Coffee      $1.00
B: Tea  $ .75
C: Hot Chocolate    $1.25
D: Cappuccino  $2.50
3. Enter the beverage A,B,C, or D you desire
Enter E to exit the program

```

It ran because the name of the Boolean variable is the default for true

Source code

```

// This program displays a hot beverage menu and prompts the user to
// make a selection. A switch statement determines which item the user

```



```
// has chosen. A do-while loop repeats until the user selects item E  
// from the menu.
```

```
// PLACE YOUR NAME HERE
```

```
#include <iostream>
```

```
#include <iomanip>
```

```
using namespace std;
```

```
int main()
```

```
{
```

```
    // Fill in the code to define an integer variable called number,
```

```
    int number;
```

```
    // a floating point variable called cost,
```

```
    float cost;
```

```
    // and a character variable called beverage
```

```
    char beverage;
```

```
    bool validBeverage;
```

```
    cout << fixed << showpoint << setprecision(2);
```

```
    do
```

```
    {
```

```
cout << endl << endl;

cout << "Hot Beverage Menu" << endl << endl;

cout << "A: Coffee      $1.00" << endl;

cout << "B: Tea  $ .75" << endl;

cout << "C: Hot Chocolate    $1.25" << endl;

cout << "D: Cappuccino $2.50" << endl << endl << endl;


cout << "Enter the beverage A,B,C, or D you desire" << endl;

cout << "Enter E to exit the program" << endl << endl;


// Fill in the code to read in beverage

cin>>beverage;


switch (beverage)
{
case 'a':

case 'A':

case 'b':

case 'B':

case 'c':

case 'C':

case 'd':

case 'D':
```

```
        validBeverage = true;

        break;

default:

    validBeverage = false;

}


if (validBeverage)

{

    cout << "How many cups would you like?" << endl;

    cin>>number;

    // Fill in the code to read in number

}


// Fill in the code to begin a switch statement

// that is controlled by beverage

switch(beverage)

{

case 'a':

case 'A':

    cost = number * 1.0;

    cout << "The total cost is $ " << cost << endl;

    break;
```

```
// Fill in the code to give the case for hot chocolate ($1.25 a cup)
```

```
case 'b':
```

```
case 'B':
```

```
    cost=number*0.75;
```

```
    cout << "The total cost is $ " << cost << endl;
```

```
    break;
```

```
// Fill in the code to give the case for tea ( $0.75 a cup)
```

```
case 'c':
```

```
case 'C':
```

```
    cost=number*1.25;
```

```
    cout << "The total cost is $ " << cost << endl;
```

```
    break;
```

```
// Fill in the code to give the case for cappuccino ($2.50 a cup)
```

```
case 'd':
```

```
case 'D':
```

```
    cost=number*2.5;
```

```
    cout << "The total cost is $ " << cost << endl;
```

```
    break;
```

```
case 'e':
```

```
case 'E':
```

```
    cout << " Please come again" << endl;
```

```
    break;
```

```
default:
```

```

        cout <<          "selection invalid Try again please" << endl;

        // Fill in the code to write a message

        // indicating an invalid selection.

    }

}

while((beverage!='e')||(beverage!='E'));

// Fill in the code to finish the do-while statement with the

// condition that beverage does not equal E or e.


// Fill in the appropriate return statement

return 0;

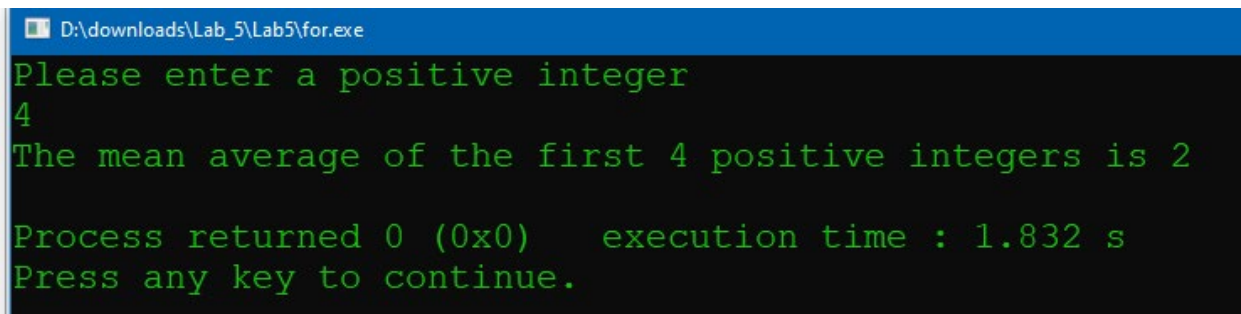
}

```

5.3

1. I think the type cast is to deal with the multiple variable types in the program

I think if it is removed the numbers will not be formatted correctly



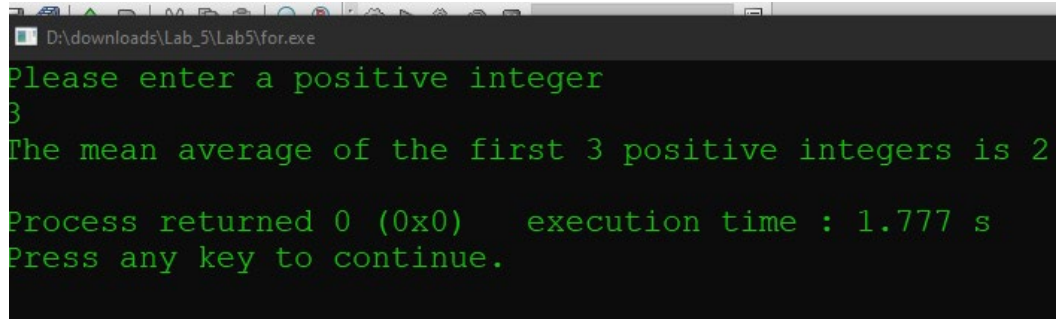
```

D:\downloads\Lab_5\Lab5\for.exe
Please enter a positive integer
4
The mean average of the first 4 positive integers is 2

Process returned 0 (0x0)   execution time : 1.832 s
Press any key to continue.

```

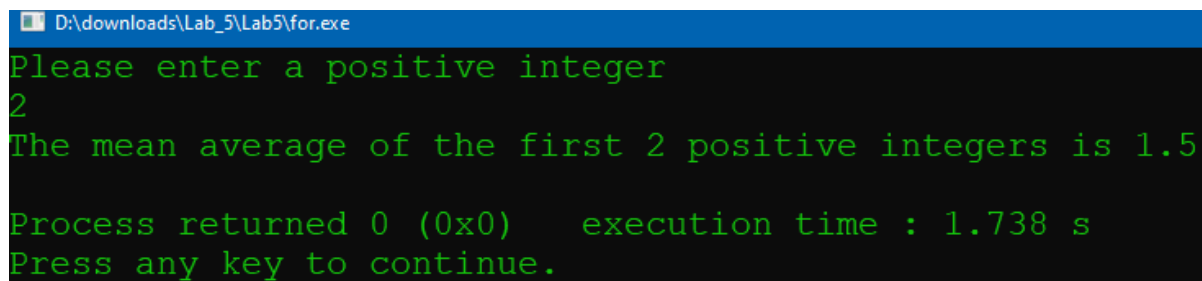
The decimal place is cutoff



```
D:\downloads\Lab_5\Lab5\for.exe
Please enter a positive integer
3
The mean average of the first 3 positive integers is 2
Process returned 0 (0x0) execution time : 1.777 s
Press any key to continue.
```

It is the same for this case

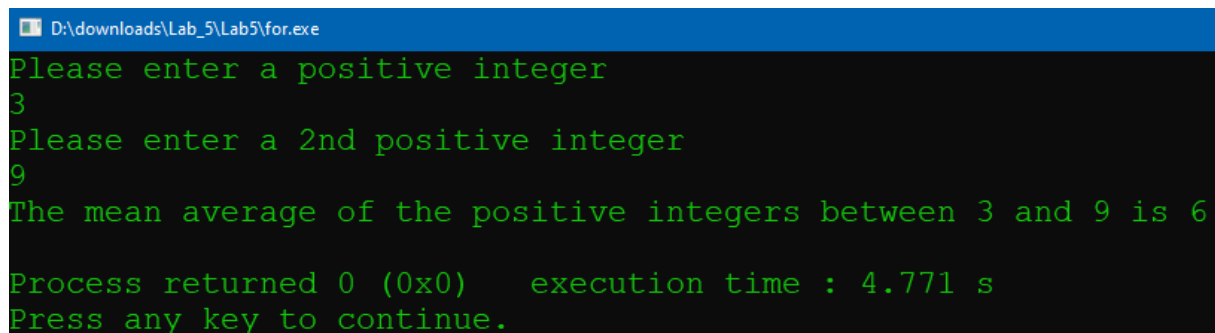
2.



```
D:\downloads\Lab_5\Lab5\for.exe
Please enter a positive integer
2
The mean average of the first 2 positive integers is 1.5
Process returned 0 (0x0) execution time : 1.738 s
Press any key to continue.
```

It cuts off the decimal places on the input and only uses the first number

3.



```
D:\downloads\Lab_5\Lab5\for.exe
Please enter a positive integer
3
Please enter a 2nd positive integer
9
The mean average of the positive integers between 3 and 9 is 6
Process returned 0 (0x0) execution time : 4.771 s
Press any key to continue.
```

Source Code

```
// This program has the user input a number n and then finds the
```

```
// mean of the first n positive integers
```

```
// PLACE YOUR NAME HERE
```

```
#include <iostream>
```

```
using namespace std;
```

```
int main()
```

```
{
```

```
    int value,value2;           // value is some positive number n
```

```
    int total = 0;  // total holds the sum of the first n positive numbers
```

```
    int number;           // the amount of numbers
```

```
    float mean;           // the average of the first n positive numbers
```

```
    cout << "Please enter a positive integer" << endl;
```

```
    cin >> value;
```

```
        cout << "Please enter a 2nd positive integer" << endl;
```

```
    cin >> value2;
```

```
    if (value > 0)
```

```
    {
```

```
        for (number = value; number <= value2; number++)
```

```
        {
```

```
            total = total + number;
```

```
} // curly braces are optional since there is only one statement
```

```
mean =static_cast<float>(total) / (value2-value+1); // note the use of the typecast
```

```
// operator here
```

```
cout << "The mean average of the positive integers between " << value
```

```
<< " and " << value2<<" is "<<mean << endl;
```

```
}
```

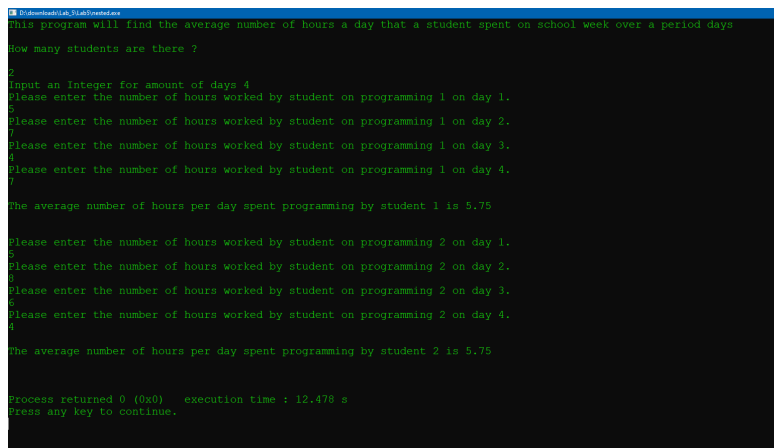
```
else
```

```
cout << "Invalid input - integer must be positive" << endl;
```

```
return 0;
```

```
}
```

5.4



```
1. C:\Users\Student\Documents> g++ 5.4.cpp
2. This program will find the average number of hours a day that a student spent on school week over a period days
3. How many students are there ?
4. 2
5. Input an Integer for amount of days 4
6. Please enter the number of hours worked by student on programming 1 on day 1.
7. 5
8. Please enter the number of hours worked by student on programming 1 on day 2.
9. 7
10. Please enter the number of hours worked by student on programming 1 on day 3.
11. 4
12. Please enter the number of hours worked by student on programming 1 on day 4.
13. 7
14. The average number of hours per day spent programming by student 1 is 5.75
15.
16. Please enter the number of hours worked by student on programming 2 on day 1.
17. 5
18. Please enter the number of hours worked by student on programming 2 on day 2.
19. 8
20. Please enter the number of hours worked by student on programming 2 on day 3.
21. 6
22. Please enter the number of hours worked by student on programming 2 on day 4.
23. 4
24. The average number of hours per day spent programming by student 2 is 5.75
25.
26. Process returned 0 (0x0)   execution time : 12.478 s
27. Press any key to continue.
```


2.

```
D:\downloads\Lab_5\Lab5\nested.exe
This program will find the average number of hours a day that a student spent on school week over a period days
How many students are there ?
2
Input an Integer for amount of days 4
Please enter the number of hours worked on programming by student 1 on day 1.
6
Please enter the number of hours worked on programming by student 1 on day 2.
5
Please enter the number of hours worked on programming by student 1 on day 3.
7
Please enter the number of hours worked on programming by student 1 on day 4.
6
Please enter the number of hours worked on biology by student 1 on day 1.
5
Please enter the number of hours worked on biology by student 1 on day 2.
4
Please enter the number of hours worked on biology by student 1 on day 3.
5
Please enter the number of hours worked on biology by student 1 on day 4.
7
The average number of hours per day spent programming by student 1 is 6
.
The average number of hours per day spent on biology by student 1 is 5.25
The combined number of hours spent on both subjects by student 1 is 11.25

Please enter the number of hours worked on programming by student 2 on day 1.
6
Please enter the number of hours worked on programming by student 2 on day 2.
5
Please enter the number of hours worked on programming by student 2 on day 3.
7
Please enter the number of hours worked on programming by student 2 on day 4.
5
Please enter the number of hours worked on biology by student 2 on day 1.
4
Please enter the number of hours worked on biology by student 2 on day 2.
7
Please enter the number of hours worked on biology by student 2 on day 3.
6
Please enter the number of hours worked on biology by student 2 on day 4.
5
The average number of hours per day spent programming by student 2 is 5.75
The average number of hours per day spent on biology by student 2 is 5.5
The combined number of hours spent on both subjects by student 2 is 11.25
```

Source Code

```
// This program finds the average time spent programming by a student
```

```
// each day over a three day period.
```

```
// PLACE YOUR NAME HERE
```

```

#include <iostream>

using namespace std;

int main()
{
    int numStudents,n;

    float numHours1, total1, average1,numHours2,total2, average2,average3;

    int student, day = 0;// these are the counters for the loops

    cout << "This program will find the average number of hours a day"
        << " that a student spent on school week over a period days\n\n";

    cout << "How many students are there ?" << endl << endl;

    cin >> numStudents;

    cout << "Input an Integer for amount of days ";

    cin>>n;

    for (student = 1; student <= numStudents; student++)
    {
        total1 = 0;

        total2 = 0;
    }

```

```

for (day = 1; day <= n; day++)
{
    cout << "Please enter the number of hours worked on programming by student "
        << student << " on day " << day << "." << endl;

    cin >> numHours1;

    total1 = total1 + numHours1;
}

for (day = 1; day <= n; day++)
{
    cout << "Please enter the number of hours worked on biology by student "
        << student << " on day " << day << "." << endl;

    cin >> numHours2;

    total2 = total2 + numHours2;
}

average1 = total1 / n;
average2 = total2 / n;
average3=(average1+average2);

cout << endl;

cout << "The average number of hours per day spent programming by "

```

```

        << "student " << student << " is " << average1
        << endl << endl << endl;

        cout << endl;

        cout << "The average number of hours per day spent on biology by "
        << "student " << student << " is " << average2
        << endl << endl << endl;

        cout << "The combined number of hours spent on both subjects by "
        << "student " << student << " is " << average3
        << endl << endl << endl;

    }

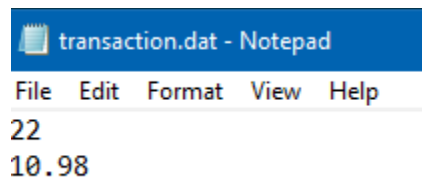
    return 0;

}

```

5.5/3.5

1.

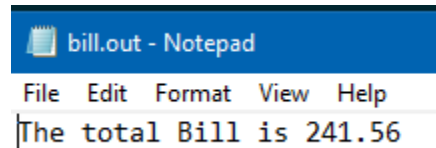


```

transaction.dat - Notepad
File Edit Format View Help
22
10.98

```

2.



```

bill.out - Notepad
File Edit Format View Help
The total Bill is 241.56

```

Source Code

```
// This program will read in the quantity of a particular item and its price.  
  
// It will then print out the total price.  
  
// The input will come from a data file and the output will go to  
  
// an output file.
```

```
// PLACE YOUR NAME HERE
```

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

```
int main()  
{  
  
    ifstream dataIn;    // defines an input stream for a data file  
  
    ofstream dataOut; // defines an output stream for an output file  
  
    int quantity;       // contains the amount of items purchased  
  
    float itemPrice;    // contains the price of each item  
  
    float totalBill;    // contains the total bill, i.e. the price of all items  
  
  
    dataIn.open("transaction.dat");    // This opens the file.  
  
    dataOut.open("bill.out");
```

// Fill in the appropriate code in the blank below

```
cout<< setprecision(2) << fixed << showpoint;    // formatted output
```

```
dataIn>>quantity>>itemPrice;
```

```
cout<<"What is the quantity of the the item?"<<endl;
```

```
dataIn>>quantity>>itemPrice;
```

```
cout<<"What is the price of the item?"<<endl;
```

// Fill in the input statement that brings in the

// quantity and price of the item

// Fill in the assignment statement that determines the total bill.

```
totalBill=(itemPrice*quantity);
```

```
dataOut<<"The total Bill is "<<totalBill<<endl;
```

// Fill in the output statement that prints the total bill, with a label,

// to an output file

```
return 0;
```

```
}
```

Option 3

```
D:\Documents\Programming\lab_5.6_sick_tellers.exe
How many tellers worked at Gotham Bank during each of the last three years?
2
How many days was teller 1 sick during year 1
5
How many days was teller 1 sick during year 2
8
How many days was teller 1 sick during year 3
2
How many days was teller 2 sick during year 1
1
How many days was teller 2 sick during year 2
0
How many days was teller 2 sick during year 3
3
The 2 tellers were out a total of 19 days during the last 3 years

Process returned 0 (0x0)    execution time : 9.133 s
Press any key to continue.
```

```
D:\Documents\Programming\lab_5.6_sick_tellers.exe
How many tellers worked at Gotham Bank during each of the last three years?
4
How many days was teller 1 sick during year 1
4
How many days was teller 1 sick during year 2
2
How many days was teller 1 sick during year 3
7
How many days was teller 2 sick during year 1
4
How many days was teller 2 sick during year 2
5
How many days was teller 2 sick during year 3
8
How many days was teller 3 sick during year 1
5
How many days was teller 3 sick during year 2
4
How many days was teller 3 sick during year 3
3
How many days was teller 4 sick during year 1
2
How many days was teller 4 sick during year 2
6
How many days was teller 4 sick during year 3
4
The 4 tellers were out a total of 54 days during the last 3 years

Process returned 0 (0x0)    execution time : 10.511 s
Press any key to continue.
```

```
D:\Documents\Programming\lab_5.6_sick_tellers.exe
How many tellers worked at Gotham Bank during each of the last three years?
3
How many days was teller 1 sick during year 1
5
How many days was teller 1 sick during year 2
4
How many days was teller 1 sick during year 3
3
How many days was teller 2 sick during year 1
7
How many days was teller 2 sick during year 2
3
How many days was teller 2 sick during year 3
4
How many days was teller 3 sick during year 1
2
How many days was teller 3 sick during year 2
2
How many days was teller 3 sick during year 3
4
The 3 tellers were out a total of 34 days during the last 3 years

Process returned 0 (0x0)   execution time : 8.687 s
Press any key to continue.
```

Source Code

```
#include <fstream>

#include <iomanip>

#include <iostream>

using namespace std;

int main()

{

    int tellers;

    int sick_total=0

        ;
```



```

    cout<<"How many tellers worked at Gotham Bank during each of the last three
years?"<<endl;

    cin>>tellers;

    //get tellers

    for(int i=1; i<=tellers; i++)
    {
        for(int j=1; j<=3; j++)
        {
            int temp_sick=0;

            cout<<"How many days was teller "<<i<<" sick during year "<<j<<endl;

            cin>>temp_sick;

            cin.clear();

            sick_total+=temp_sick;

            //add to total

        }
    }

    cout<<"The "<<tellers<<" tellers were out a total of "<< sick_total<<" days during the last 3
years"<<endl;

    //output

    return 0;

}

```