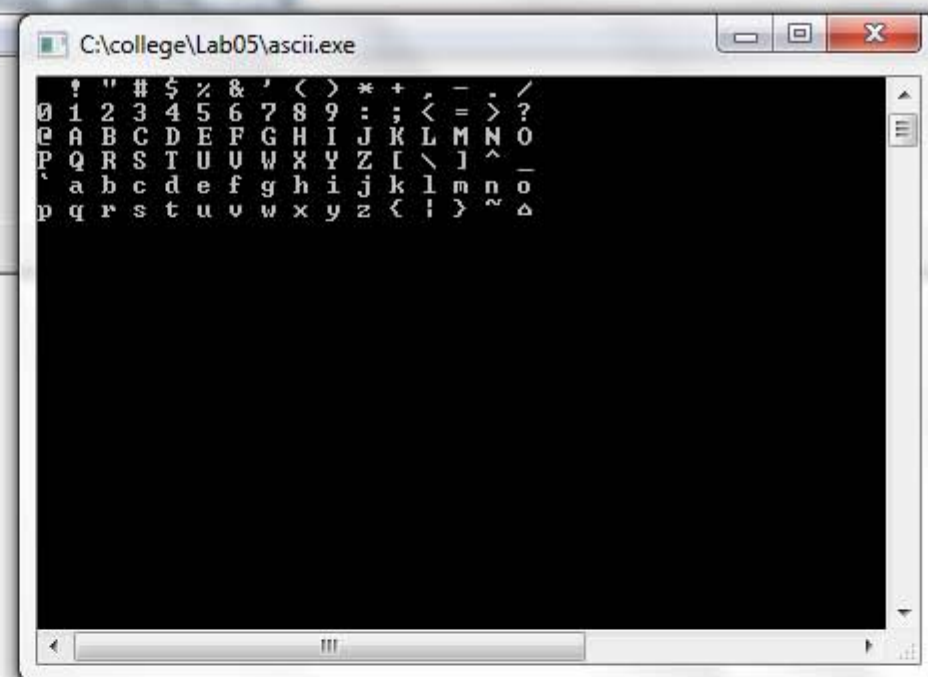


```
1 // Aaron Carter
2 // Programming Challenges for chapter 5
3 // # 1 - Characters for the ASCII codes
4
5 #include <iostream>
6 using namespace std;
7
8 int main() {
9
10 int num = 32;
11 int counter = 0;
12
13 while (num >= 32 && num <= 127) {
14     cout << (char)num << " ";
15     num++;
16     counter++;
17     if (counter == 16) {
18         cout << "\n";
19         counter = 0;
20     }
21 }
22
23 cin.ignore();
24 return 0;
25 }
26
```





sumofnumbers.cpp | ascii.cpp

```
1 // Aaron Carter
2 // Programming Challenges for chapter 5
3 // #2 - Sum of Numbers
4 // This program asks for a number and prints out the sum of
5 // the numbers 1 to the number entered
6
7 #include <iostream>
8 using namespace std;
9
10 int main () {
11     int sum = 0;
12     int endnum = 0;
13
14     cout << "This program will print the sum of all numbers from 1 to n" << endl;
15     cout << "Please enter a positive integer: ";
16     cin >> endnum;
17
18     if (endnum < 1) {
19         cout << "Input Validation: Do not accept an input that is less than 1." << endl;
20     }
21     else {
22
23         for (int x = 1; x <= endnum; x++) {
24             sum += x;
25         }
26         cout << "The sum is: " << sum;
27     }
28     cin.get();
29     cin.ignore();
30     return 0;
31 }
32
33
```

C:\college\Lab05\sumofnumbers.exe

```
This program will print the sum of all numbers from 1 to n
Please enter a positive integer: 50
The sum is: 1275
```

C:\college\Lab05\sumofnumbers.exe

```
This program will print the sum of all numbers from 1 to n
Please enter a positive integer: 10
The sum is: 55_
```

C:\college\Lab05\sumofnumbers.exe

```
This program will print the sum of all numbers from 1 to n
Please enter a positive integer: -5
Input Validation: Do not accept an input that is less than 1.
```



sumofnumbers.cpp | ascii.cpp | distance.cpp |

```
1 // Aaron Carter
2 // Programming Challenges for chapter 5
3 // #3 - Distance Traveled
4 // This program calculates the total distance a vehicle traveled
5
6 #include <iostream>
7 using namespace std;
8
9 int main () {
10     int mph = 0;
11     int hours = 0;
12
13     cout << "What is the speed of the vehicle in mph? ";
14     cin >> mph;
15     cout << "How many hours has it traveled? ";
16     cin >> hours;
17
18     cout << "Hour      Distance Traveled" << endl;
19     cout << "-----" << endl;
20
21     if (mph < 0 || hours < 1) {
22         cout << "Invalid input. Speed cannot be negative and time must be at least 1" << endl;
23     }
24     else {
25         for (int x = 1; x <= hours; x++) {
26             cout << "    " << x << "          " << mph*x << endl;
27         }
28     }
29
30     cin.get();
31     cin.ignore();
32     return 0;
33 }
```

C:\college\Lab05\distance.exe

```
What is the speed of the vehicle in mph? 40
How many hours has it traveled? 3
Hour      Distance Traveled
-----
1          40
2          80
3         120
```

C:\college\Lab05\distance.exe

```
What is the speed of the vehicle in mph? -20
How many hours has it traveled? 1
Hour      Distance Traveled
-----
Invalid input. Speed cannot be negative and time must be at least 1
```



```
1 // Aaron Carter
2 // Programming Challenges for chapter 5
3 // #4 - Celcius to Fahrenheit Table
4 // This program shows a table of celcius temperatures to Fahrenheit
5
6 #include <iostream>
7 #include <iomanip>
8 using namespace std;
9
10 int main() {
11     cout << setw(10) << "Celsius" << setw(15) << "Fahrenheit" << endl;
12     cout << "-----" << endl;
13
14     for (int x = 0; x<=20; x++) {
15         cout << setw(10) << x << setw(15) << (double)x*9/5 + 32 << endl;
16     }
17
18     cin.ignore();
19     cin.get();
20 }
21
22
```

C:\college\Lab05\temptable.exe

Celsius	Fahrenheit
0	32
1	33.8
2	35.6
3	37.4
4	39.2
5	41
6	42.8
7	44.6
8	46.4
9	48.2
10	50
11	51.8
12	53.6
13	55.4
14	57.2
15	59
16	60.8
17	62.6
18	64.4
19	66.2
20	68

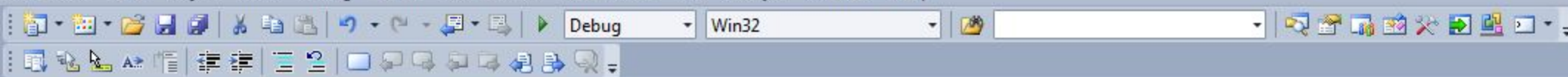


```

1 // Aaron Carter
2 // Programming Challenges for chapter 5
3 // #5 - Speed Conversion chart
4 // This program displays a table converting kilometers per hour to mph
5
6 #include <iostream>
7 #include <iomanip>
8 using namespace std;
9
10 int main() {
11     cout << setw(10) << "Kilometers/hour" << setw(15) << "Miles/hour" << endl;
12     cout << "-----" << endl;
13
14     for (int x = 60; x<=130; x+=5) {
15         cout << setw(10) << x << setw(15) << x*0.6214 << endl;
16     }
17
18     cin.ignore();
19     cin.get();
20 }
21
22

```

60	37.284
65	40.391
70	43.498
75	46.605
80	49.712
85	52.819
90	55.926
95	59.033
100	62.14
105	65.247
110	68.354
115	71.461
120	74.568
125	77.675
130	80.782



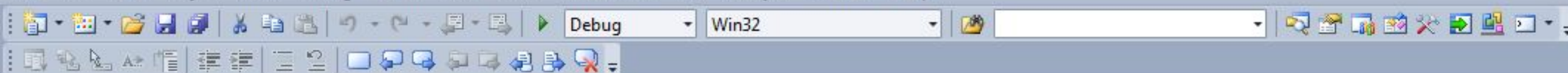
Lab05\_1.cpp\* X

(Global Scope)

```
1 // Lab05_1.cpp
2 // Lab 05, Step 1
3 // Aaron Carter, CS-150
4
5 #include "stdafx.h"
6 #include <iostream>
7 #include <cmath>
8 using namespace std;
9
10
11 int main()
12 {
13     int a = 5, b = 6,
14         c = 3, d = 7;
15
16     cout << a-- << ' ';
17     cout << a << ' ';
18     cout << a-- << ' ' << a-- << ' ';
19     cout << a-- << ' ' << a << endl;
20
21     cout << ++b << ' ';
22     cout << b << ' ';
23     cout << ++b << ++b << ' ';
24     cout << ++b << ' ' << b << endl;
25
26     a = c++ * d--;
27     cout << a << " " << c << ' ' << d << endl;
28
29     return 0;
30 }
31
32
33
```

C:\Windows\system32\cmd.exe

```
5 4 3 4 2 1
7 7 99 10 10
21 4 6
Press any key to continue . . .
```



InfiniteLoop.cpp

(Global Scope)

\_tmain()

```
13  int i,      // Loop control variable.
14      sum;    // Accumulator.
15
16  i = 1;
17  while (i < 10)
18      { cout << i << ' ';
19        i +=2;
20      }
21  cout << "\nAfter loop i = " << i << endl << endl;
22
23  i = 5;
24  while (i > 0)
25      cout << i-- << ' ';
26  cout << "\nAfter loop i = " << i << endl << endl;
27
28  i = 1;
29  do
30      { cout << i * i << ' ';
31        i++;
32      } while (i <= 3);
33  cout << "\nAfter loop i = " << i << endl << endl;
34
35  sum = 0;
36  for (i = 0; i < 4; i++)
37      sum += i;
38  cout << "After loop i = " << i << endl;
39  cout << "sum = " << sum << endl << endl;
40
41  for (i =0; i++ < 4;)
42      cout << i << ' ';
43  cout << "\nAfter loop i = " << i << endl;
44
45
46  return 0;
47 }
48
49
```

C:\Windows\system32\cmd.exe

```
1 3 5 7 9
After loop i = 11
5 4 3 2 1
After loop i = 0
1 4 9
After loop i = 4
After loop i = 4
sum = 6
1 2 3 4
After loop i = 5
Press any key to continue . . .
```



loops.cpp | nom.cpp

```
1 // Lab 5 - loops.cpp Working with looping structures
2 // Lab 5.3
3 // Aaron Carter
4
5 #include <iostream>
6 using namespace std;
7
8 int main()
9 {
10     cout << "Aaron Carter. \n";
11     cout << "\nActivity 1 \n===== \n";
12     // Change the following do-while loop to a while loop.
13     int inputNum;
14     while (inputNum != 0)
15     { cout << "Enter a number (or 0 to quit): ";
16       cin >> inputNum;
17     }
18
19     cout << "\nActivity 2 \n===== \n";
20     // Change the following while loop to a do-while loop.
21     char doAgain = 'y';
22     do
23     { cout << "Do you want to loop again? (y/n) ";
24       cin >> doAgain;
25     } while (doAgain == 'Y' || doAgain == 'y');
26
27     cout << "\nActivity 3 \n===== \n";
28     // Change the following while loop to a for loop.
29     int count = 0;
30     for (count = 0; count < 5; count++)
31         cout << "Count is " << count << endl;
32
33     cout << "\nActivity 4 \n===== \n";
```

C:\college\loops.exe

```
Aaron Carter.

Activity 1
=====
Enter a number (or 0 to quit): 5
Enter a number (or 0 to quit): 2
Enter a number (or 0 to quit): 0

Activity 2
=====
Do you want to loop again? (y/n) y
Do you want to loop again? (y/n) Y
Do you want to loop again? (y/n) n

Activity 3
=====
Count is 0
Count is 1
Count is 2
Count is 3
Count is 4

Activity 4
=====
5 seconds to go.
4 seconds to go.
3 seconds to go.
2 seconds to go.
1 seconds to go.

Activity 5
=====
$****
$****
$****
```





```
// Lab 5 Step 4
// This program finds the average number of boxes of cookies
// sold by the children in a particular scout troop.
// It illustrates the use of a counter, an accumulator,
// and an end sentinel.
// Aaron Carter
#include <iostream>
using namespace std;

int main()
{
    int numBoxes,          // Number of boxes of cookies sold by one child
        totalBoxes,       // Accumulates total boxes sold by the entire troop
        numSeller;        // Counts the number of children selling cookies

    double averageBoxes;   // Average number of boxes sold per child

    totalBoxes = 0;
    numSeller = 1;

    cout << "          **** Cookie Sales Information **** \n\n";

    // Get the first input
    cout << "Enter number of boxes of cookies sold by seller " << numSeller
         << " (or -1 to quit): ";
    cin >> numBoxes;

    while (numBoxes != -1) {
        totalBoxes += numBoxes;
        numSeller += 1;
        cout << "Enter number of boxes of cookies sold by next seller " << numSeller << " (or -1 to quit): ";
        cin >> numBoxes;
    }

    numSeller -= 1;

    // WHEN THE LOOP IS EXITED, THE VALUE STORED IN THE numSeller COUNTER
    // WILL BE ONE MORE THAN THE ACTUAL NUMBER OF SELLERS. SO WRITE CODE
    // TO ADJUST IT TO THE ACTUAL NUMBER OF SELLERS.

    if (numSeller == 0)          // If true, -1 was the very first entry
        cout << "\nNo boxes were sold.\n";

    else
    {
        averageBoxes = (double)totalBoxes/numSeller;
        cout << numSeller << " troop members have sold an average of " << averageBoxes << " boxes of cookies per person.";
    }

    cin.ignore();
    cin.get();
}
```

\*\*\*\* Cookie Sales Information \*\*\*\*

```
Enter number of boxes of cookies sold by seller 1 (or -1 to quit): 0
Enter number of boxes of cookies sold by next seller 2 (or -1 to quit): 10
Enter number of boxes of cookies sold by next seller 3 (or -1 to quit): -1
2 troop members have sold an average of 5 boxes of cookies per person.
```



areas2.cpp

```
1 // Lab 5 areas2.cpp
2 // Lab 5.5
3 // Aaron Carter
4
5 #include <iostream>
6 using namespace std;
7
8 int main() {
9     int choice = 0;
10    // DEFINE THE NAMED CONSTANT PI HERE AND SET ITS VALUE TO 3.14159
11    const double pi = 3.14159;
12
13    // DECLARE ALL NEEDED VARIABLES HERE. GIVE EACH ONE A DESCRIPTIVE
14    // NAME AND AN APPROPRIATE DATA TYPE.
15    double radius = 0;
16    double side = 0;
17    double base = 0;
18    double height = 0;
19
20    do {
21
22        // WRITE STATEMENTS HERE TO DISPLAY THE 4 MENU CHOICES.
23        cout << "\nProgram to calculate areas of objects" << endl;
24        cout << "1 -- square" << endl;
25        cout << "2 -- circle" << endl;
26        cout << "3 -- right triangle" << endl;
27        cout << "4 -- quit" << endl << endl;
28
29        // WRITE A STATEMENT HERE TO INPUT THE USER'S MENU CHOICE.
30        cin >> choice;
31
32        // USE AN IF/ELSE IF STATEMENT TO OBTAIN ANY NEEDED INPUT INFORMATION
33        // AND COMPUTE AND DISPLAY THE AREA FOR EACH VALID MENU CHOICE.
```

C:\college\areas2.exe

```
Program to calculate areas of objects
1 -- square
2 -- circle
3 -- right triangle
4 -- quit
```

```
1
Side of the square: 4
Area = 16
```

```
Program to calculate areas of objects
1 -- square
2 -- circle
3 -- right triangle
4 -- quit
```

```
2
Radius of the circle: 3
Area = 28.2743
```

```
Program to calculate areas of objects
1 -- square
2 -- circle
3 -- right triangle
4 -- quit
```

```
3
Base of the triangle: 2
Height of the triangle: 4
Area = 4
```

```
Program to calculate areas of objects
1 -- square
2 -- circle
3 -- right triangle
4 -- quit
```

```
4
Bye bye.
```



areas2.cpp summation.cpp

```

1 // Lab 5 - summation.cpp
2 // This program displays a series of terms and computes its sum.
3 // Lab 5.6
4 // Aaron Carter
5
6 #include <iostream>
7 #include <cmath>
8 using namespace std;
9
10 int main()
11 {
12     int denom,           // Denominator of a particular term
13         finalDenom = 64; // Denominator of the final term
14     double sum = 0.0;    // Accumulator that adds up all terms in the series
15     char doAgain;
16
17     cout << "Aaron Carter \n";
18     cout << "This program sums the series 1/2^1 + 1/2^2 + 1/2^3 + . . . + 1/2^n" << endl;
19
20     do {
21         cout << "What should n be in the final term (2 - 10)? ";
22         cin >> finalDenom;
23
24         sum = 0.0;
25
26         // WRITE THE CODE TO START A FOR LOOP THAT LOOPS ONCE FOR EACH TERM.
27         // I.E., FOR TERMS WITH DENOMINATORS FROM 2 TO THE FINAL DENOMINATOR.
28         for (int x = 1; x<=finalDenom; x++)
29         {
30             // WRITE THE CODE TO PRINT THIS TERM.
31             // IF IT IS NOT THE LAST TERM, FOLLOW IT WITH A +.
32             // IF IT IS THE LAST TERM, FOLLOW IT WITH A =.
33             if (x!=finalDenom) {

```

C:\college\summation.exe

```

Aaron Carter
This program sums the series 1/2^1 + 1/2^2 + 1/2^3 + . . . + 1/2^n
What should n be in the final term (2 - 10)? 5
1/2^1 + 1/2^2 + 1/2^3 + 1/2^4 + 1/2^5 = 0.96875
Would you like to compute another series? (y/n): y
What should n be in the final term (2 - 10)? 6
1/2^1 + 1/2^2 + 1/2^3 + 1/2^4 + 1/2^5 + 1/2^6 = 0.984375
Would you like to compute another series? (y/n): y
What should n be in the final term (2 - 10)? 8
1/2^1 + 1/2^2 + 1/2^3 + 1/2^4 + 1/2^5 + 1/2^6 + 1/2^7 + 1/2^8 = 0.996094
Would you like to compute another series? (y/n): y
What should n be in the final term (2 - 10)? 10
1/2^1 + 1/2^2 + 1/2^3 + 1/2^4 + 1/2^5 + 1/2^6 + 1/2^7 + 1/2^8 + 1/2^9 + 1/2^10 =
0.999023
Would you like to compute another series? (y/n): _

```