

CS150 Intro to CS I

Fall 2015

Chapter 3 Formatting Output

- Reading: Chapter 3 (3.7 pp. 108-117)
- Good Problems to Work: pp. 117-118[3.17, 3.19]

Lab Review

- Constants
- char variables
- if statements
- Checking that the user has selected a valid menu choice

const Declarations

- Constant declaration
`const double PI = 3.14;`
`const double RADIUS = 5.4;`
- Constant declarations are fixed and cannot be changed
- By convention, constants are always UPPERCASE

Formatting Output

- How can we force output to look a particular way?
 1. Precision of numbers
 2. Spacing around the output

```
Here are some floating point numbers:  
72.0  
72.00  
72.000  
Here is a table of data:  
  4   cat   15  
100  6     2.1
```

Precision

```
const double PI = 3.141592653589793;  
cout << PI << endl; // default output 3.14159
```

- Floating-point numbers can be rounded to a number of significant digits (precision)

```
cout << setprecision (3) << PI; // output 3.14
```

Precision

- Precision can also be used to set the number of digits after the decimal point
- What is the output?

```
const double PI = 3.141592653589793;  
cout << fixed << setprecision (2) << PI;
```

Precision of numbers

```
#include <iostream>  
#include <iomanip> //New Library!  
  
using namespace std;  
  
int main()  
{  
    const double PI = 3.141592653589793;  
  
    cout << PI << endl; // default output  
    cout << fixed << setprecision (4) << PI << endl;  
    cout << fixed << setprecision (3) << PI << endl;  
    cout << fixed << setprecision (2) << PI << endl;  
    cout << fixed << setprecision (1) << PI << endl;  
  
    return EXIT_SUCCESS;  
}
```

Precision

- Precision and fixed are sticky (i.e they remain in effect until changed)
- What is the output?

```
const double PI = 3.141592653589793;
cout << fixed << setprecision (4) << PI << endl;
cout << setprecision (2) << PI << endl;
cout << PI << endl;
```

Output with Spacing

```
#include <iostream>
#include <iomanip>
#include <string>

using namespace std;

int main()
{
    string name = "cs150";
    int integer = 42;

    cout << setw (6) << name << setw (6) << integer << endl;
    cout << setw (4) << integer << endl;

    return EXIT_SUCCESS;
}
```

setw

- setw is not sticky
 - you must specify setw every time you want a specific field width specified
- What is the output?

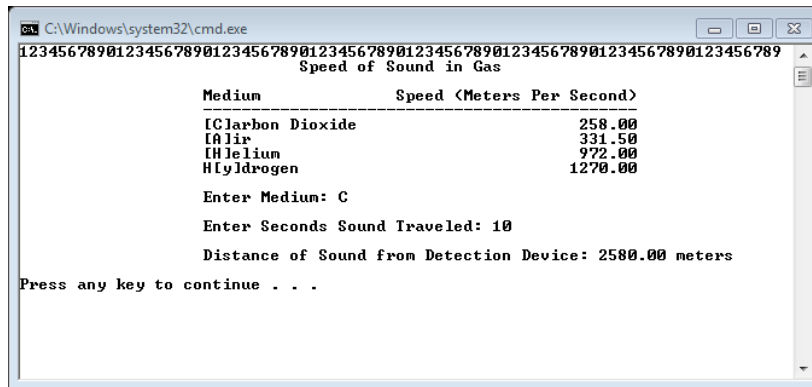
```
int integer = 42;  
cout << setw (6) << integer << integer << endl;
```

Problem

- Write a program segment that allows the user the ability to input two integer values. Display both integer values as shown below, always displaying the smaller number first.

```
Please enter two numbers: 100 9  
The numbers are:  
    9  
   100
```

How would we output the following to line it all up correctly?



```
C:\Windows\system32\cmd.exe
123456789012345678901234567890123456789012345678901234567890123456789
Speed of Sound in Gas
Medium          Speed (Meters Per Second)
-----
[C]arbon Dioxide    258.00
[H]elium            972.00
[H]ydrogen          1270.00
Enter Medium: C
Enter Seconds Sound Traveled: 10
Distance of Sound from Detection Device: 2580.00 meters
Press any key to continue . . .
```