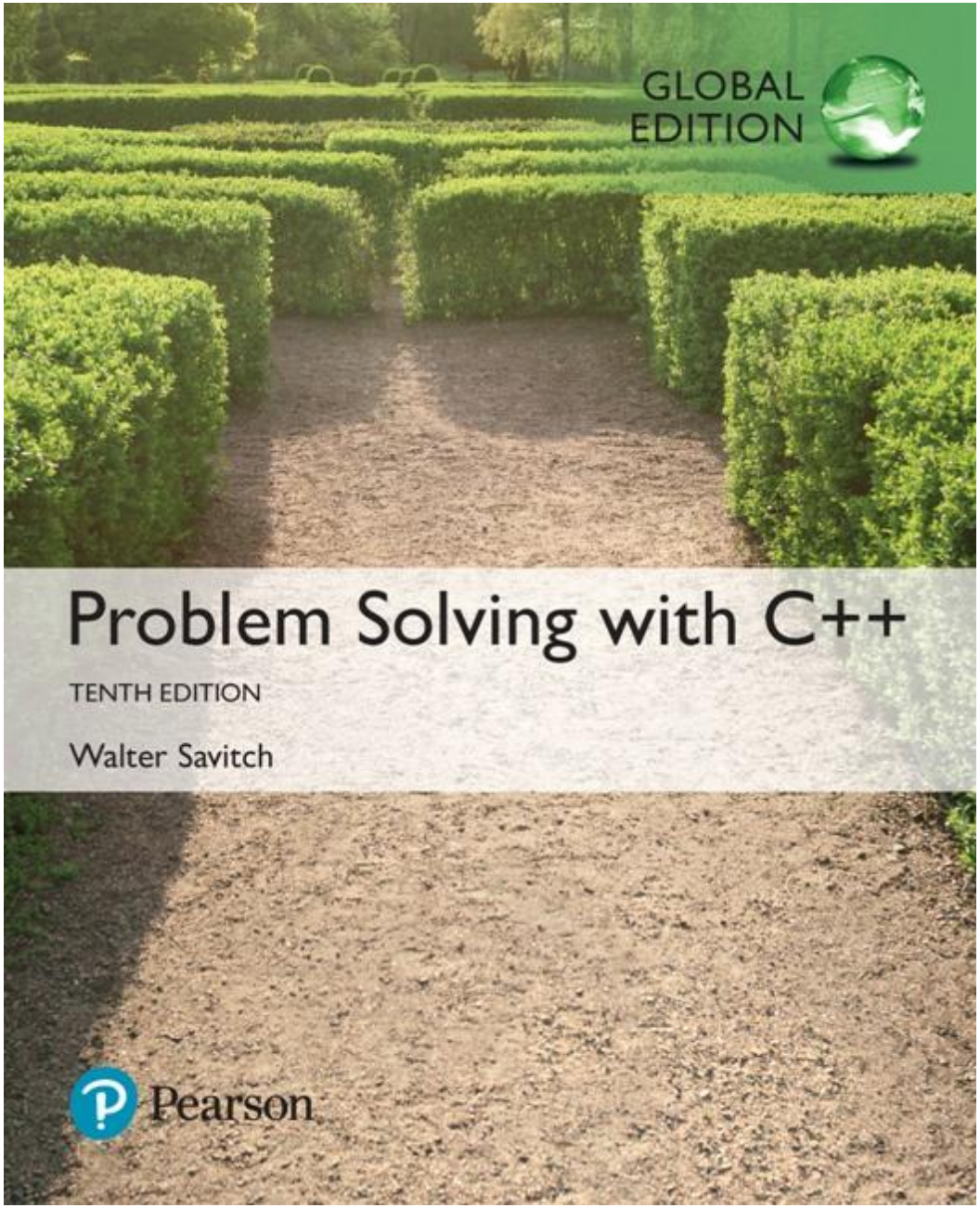
Ahram Canadian University

Fundamental of programming 1

Dr. Marian Wagdy

Lecture 2


GLOBAL
EDITION
Problem Solving with C++
TENTH EDITION
Walter Savitch
Pearson

Chapter 2

2.1

Variables and Assignments

Variables and Assignments

- Variables are like small blackboards
  - We can write a number on them
  - We can change the number
  - We can erase the number

- C++ variables are names for memory locations
  - We can write a value in them
  - We can change the value stored there
  - We cannot erase the memory location
    - Some value is always there

Identifiers

- Variables names are called identifiers

- Choosing variable names
  - Use meaningful names that represent data to be stored
  - First character must be
    - a letter
    - the underscore character
  - Remaining characters must be
    - letters
    - numbers
    - underscore character

File Edit Selection View Go ··· Test01.cpp - Visual Studio Code

Test01.cpp

C: > Users > Admin > Test01.cpp > main()

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

int main()
{
    int _num = 20;
    cout << _num;
}
```

Code

```
PS C:\Users\Admin> cd "c:\Users\Admin\" ;
 if ($?) { g++ Test01.cpp -o Test01 } ; i
f ($?) { .\Test01 }
20
PS C:\Users\Admin>
```

0 0 Blackbox Ln 8, Col 2 Spaces: 4 UTF-8 CRLF {} C++ Go Live Spell Win32 Formatting: ✓

Keywords

- Keywords (also called reserved words)
  - Are used by the C++ language
  - Must be used as they are defined in the programming language
  - Cannot be used as identifiers

Declaring Variables (Part 1)

- Before use, variables must be declared
  - Tells the compiler the type of data to store

    Examples: int numberOfBars;
    double one_weight, totalWeight;
  - int is an abbreviation for integer.
    - could store 3, 102, 3211, -456, etc.
    - number_of_bars is of type integer
  - double represents numbers with a fractional component
    - could store 1.34, 4.0, -345.6, etc.
    - one_weight and totalWeight are both of type double

File Edit Selection View Go Run Terminal Help

Test01.cpp - Visual Studio Code

Test01.cpp

C: > Users > Admin > Test01.cpp > main()

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

int main()
{
    cout << "Size of bool: " << sizeof(bool) << " byte" << endl;
    cout << "Size of char: " << sizeof(char) << " byte" << endl;
    cout << "Size of unsigned: " << sizeof(unsigned) << " byte" << endl;
    cout << "Size of short: " << sizeof(short) << " bytes" << endl;
    cout << "Size of short int: " << sizeof(short int) << " bytes" << endl;
    cout << "Size of int: " << sizeof(int) << " bytes" << endl;
    cout << "Size of long int: " << sizeof(long int) << " bytes" << endl;
    cout << "Size of int long: " << sizeof(int long) << " bytes" << endl;
    cout << "Size of float: " << sizeof(float) << " bytes" << endl;
    cout << "Size of long: " << sizeof(long) << " bytes" << endl;
    cout << "Size of long long: " << sizeof(long long) << " bytes" << endl;
    cout << "Size of long long int: " << sizeof(long long int) << " byte" << endl;
    cout << "Size of double: " << sizeof(double) << " bytes" << endl;
    cout << "Size of long double: " << sizeof(long double) << " bytes" << endl;

    return 0;
}
```

```
PS C:\Users\Admin> cd "c:\Users\Admin\" ;
 if ($?) { g++ Test01.cpp -o Test01 } ; i
f ($?) { .\Test01 }
Size of bool: 1 byte
Size of char: 1 byte
Size of unsigned: 4 byte
Size of short: 2 bytes
Size of short int: 2 bytes
Size of int: 4 bytes
Size of long int: 4 bytes
Size of int long: 4 bytes
Size of float: 4 bytes
Size of long: 4 bytes
Size of long long: 8 bytes
Size of long long int: 8 byte
Size of double: 8 bytes
Size of long double: 16 bytes
PS C:\Users\Admin>
```

0 0 Blackbox Searching... Ln 7, Col 65 Spaces: 4 UTF-8 CRLF {} C++ Go Live Spell Win32 Formatting: ✓

Declaring Variables (Part 2)

- Declaration syntax:
  - Type_name Variable_1 , Variable_2, . . . ;

- Declaration Examples:
  - double average, m_score, totalScore;
  - double moonDistance;
  - int age, numStudents;
  - int carsWaiting;

Assignment Statements

- An assignment statement changes the value of a variable
  - totalWeight = oneWeight + numberOfBars;
    - totalWeight is set to the sum oneWeight + numberOfBars
  - Assignment statements end with a semi-colon.
  - The single variable to be changed is always on the left of the assignment operator '='
  - On the right of the assignment operator can be
    - Constants -- age = 21;
    - Variables -- myCost = yourCost;
    - Expressions -- circumference = diameter * 3.14159;

Assignment Statements and Algebra

- The ‘=‘ operator in C++ is not an equal sign
  - The following statement cannot be true in algebra
    - numberOfBars = numberOfBars + 3;
  - In C++ it means the new value of numberOfBars is the previous value of numberOfBars plus 3

Initializing Variables

- Declaring a variable does not give it a value
  - Giving a variable its first value is initializing the variable

- Variables are initialized in assignment statements

```
double mpg;      // declare the variable
mpg = 26.3;      // initialize the variable
```

- Declaration and initialization can be combined using two methods
  - Method 1

    double mpg = 26.3, area = 0.0 , volume;
  - Method 2

    double mpg(26.3), area(0.0), volume;

File Edit Selection View Go Run ··· Test01.cpp - Visual Studio Code

Test01.cpp

C: > Users > Admin > Test01.cpp > main()

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

int main()
{
    // - Method 1
    double mpg1 = 26.3;
    cout << mpg1 << endl;
    // - Method 2
    double mpg2(26.3);
    cout << mpg2 << endl;

    return 0;
}
```

Code

```
PS C:\Users\Admin> cd "c:\Users\Admin\" ; if ($?) { g++ Test01.cpp -o Test01 } ; if ($?) { .\Test01 }
26.3
26.3
PS C:\Users\Admin>
```

0 0 Blackbox Ln 10, Col 23 Spaces: 4 UTF-8 CRLF {} C++ Go Live Spell Win32 Formatting: ✓

Section 2.1 Conclusion

- Can you
  - Declare and initialize two integers variables to zero? The variables are named feet and inches.
  - Declare and initialize two variables, one int and one double?
    Both should be initialized to the appropriate form of 5.
  - Give good variable names for identifiers to store
    - the speed of an automobile?
    - an hourly pay rate?
    - the highest score on an exam?

2.2

Input and Output

Input and Output

- A data stream is a sequence of data
  - Typically in the form of characters or numbers

- An input stream is data for the program to use
  - Typically originates
    - at the keyboard
    - at a file

- An output stream is the program's output
  - Destination is typically
    - the monitor
    - a file

Output using cout

- cout is an output stream sending data to the monitor
- The insertion operator "<<" inserts data into cout
- Example:

```
cout << numberOfBars << " candy bars\n";
```

  - This line sends two items to the monitor
    - The value of numberOfBars
    - The quoted string of characters " candy bars\n"
      - Notice the space before the ‘c’ in candy
      - The ‘\n’ causes a new line to be started following the ‘s’ in bars
    - A new insertion operator is used for each item of output

Examples Using cout

- This produces the same result as the previous sample

```
cout << numberOfBars;
cout << " candy bars\n";
```

- Here arithmetic is performed in the cout statement

```
cout << "Total cost is $" << (price + tax);
```

- Quoted strings are enclosed in double quotes ("Walter")
  - Don’t use two single quotes (')
- A blank space can also be inserted with

```
cout << " " ;
```

if there are no strings in which a space is desired as in " candy bars\n"

Include Directives

- Include Directives add library files to our programs
  - To make the definitions of the cin and cout available to the program:

```
#include <iostream>
```

- Using Directives include a collection of defined names
  - To make the names cin and cout available to our program:

```
using namespace std;
```

Escape Sequences

- Escape sequences tell the compiler to treat characters in a special way

- '\' is the escape character
  - To create a newline in output use

    \n – cout << "\n";

    or the newer alternative

    cout << endl;

  - Other escape sequences:

    \t -- a tab

    \\ -- a backslash character

    \" -- a quote character

File Edit Selection View Go Run ··· Test01.cpp - Visual Studio Code

Test01.cpp

C: > Users > Admin > Test01.cpp > main()

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

int main()
{
    cout << "\tMoataz" << endl;
    cout << "\\Moataz\\" << endl;
    cout << "\"Moataz\"" << endl;
    return 0;
}
```

Code

```
PS C:\Users\Admin> cd "c:\Users\Admin
\" ; if ($?) { g++ Test01.cpp -o Test
01 } ; if ($?) { .\Test01 }
        Moataz
\Moataz\
"Moataz"
PS C:\Users\Admin>
```

0 0 Blackbox Ln 6, Col 32 Spaces: 4 UTF-8 CRLF {} C++ Go Live Spell Win32 Formatting: ✓

Formatting Real Numbers

- Real numbers (type double) produce a variety of outputs

```
double price = 78.5;
cout << "The price is $" << price << endl;
```

  - The output could be any of these:

```
The price is $78.5
The price is $78.500000
The price is $7.850000e01
```

  - The most unlikely output is:

```
The price is $78.50
```

File Edit Selection View Go Run ··· Test01.cpp - Visual Studio Code

Test01.cpp

C: > Users > Admin > Test01.cpp > main()

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

int main()
{
    int num = 7.850000e01;
    cout << num << endl;
    int numm = 7e5;
    cout << numm << endl;
    int nummm = 7.850000;
    cout << nummm << endl;
    float num2 = 7.850000e01;
    cout << num2 << endl;
    float num3 = 7.850000e0;
    cout << num3 << endl;

    return 0;
}
```

Code

```
PS C:\Users\Admin> cd "c:\Users\Admin\" ; if ($?) { g++ Test01.cpp -o Test01 } ; if ($?) { .\Test01 }
78
700000
7
78.5
7.85
PS C:\Users\Admin>
```

0 0 Blackbox Searching... Ln 12, Col 30 Spaces: 4 UTF-8 CRLF {} C++ Go Live Spell Win32 Formatting: ✓

Showing Decimal Places

- cout includes tools to specify the output of type double

- To specify fixed point notation
  - setf(ios::fixed)
- To specify that the decimal point will always be shown
  - setf(ios::showpoint)
- To specify that two decimal places will always be shown
  - precision(2)

- Example:

```
cout.setf(ios::fixed);
cout.setf(ios::showpoint);
cout.precision(2);
cout      << "The price is "
          << price << endl;
```

must do:

double price;

File Edit Selection View Go Run ··· Test01.cpp - Visual Studio Code

Test01.cpp

C: > Users > Admin > Test01.cpp > main()

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

int main()
{
    int num1 = 100, num2 = 200;
    cout << num1 << endl;
    cout.setf(ios::fixed);
    cout.setf(ios::showpoint);
    cout.precision(2);
    cout << num2 << endl;

    return 0;
}
```

TERMINAL

```
PS C:\Users\Admin> cd "c:\Users\Admin\" ; if ($?) { g++ Test01.cpp -o Test01 } ; if ($?) { .\Test01 }
100
200
PS C:\Users\Admin>
```

0 0 Blackbox Searching... Ln 5, Col 2 Spaces: 4 UTF-8 CRLF {} C++ Go Live Spell Win32 Formatting: ✓

File Edit Selection View Go Run ··· Test01.cpp - Visual Studio Code

Test01.cpp

C: > Users > Admin > Test01.cpp > main()

```cpp
using namespace std;

int main()
{
    // float or double
    double num1 = 100, num2 = 200.26242;
    cout << num1 << endl;
    // ---------
    cout.setf(ios::fixed);
    cout.setf(ios::showpoint);
    cout.precision(3);
    // مع التقريب لاقرب رقم عشري
    // With rounding to the nearest decimal place
    cout << num2 << endl;
    cout << 200.26202 << endl;
    cout << 200.26252 << endl;
    return 0;
}
```

TERMINAL Code

```
+ Test01.cpp -o Test01 } ; if ($?) { .\Test01
}
PS C:\Users\Admin>
PS C:\Users\Admin> cd "c:\Users\AdminPS CPSPSP
PS C:\Users\Admin>
PS C:\Users\Admin> cd "c:\Users\Admin\" ; if (
$?) { g++ Test01.cpp -o Test01 } ; if ($?) { .
\Test01 }
100
200.262
200.262
200.263
200.263
PS C:\Users\Admin> cd "c:\Users\Admin\" ; if (
$?) { g++ Test01.cpp -o Test01 } ; if ($?) { .
\Test01 }
100.000
200.262
200.262
200.263
PS C:\Users\Admin>
```

0 0 Blackbox Searching... Ln 10, Col 27 Spaces: 4 UTF-8 CRLF {} C++ Go Live Spell Win32 Formatting: ✓

File Edit Selection View Go Run ··· Test01.cpp - Visual Studio Code

Test01.cpp

C: > Users > Admin > Test01.cpp > main()

```cpp
using namespace std;

int main()
{
    // float or double
    double num1 = 100, num2 = 200.26242;
    cout << num1 << endl;
    // ---------
    cout.setf(ios::fixed);
    cout.setf(ios::showpoint);
    cout.precision(3);
    // مع التقريب لاقرب رقم عشري
    // With rounding to the nearest decimal place
    cout << num2 << endl;
    cout << 200.26202 << endl;
    cout << 200.26252 << endl;
    return 0;
}
```

TERMINAL Code

```
+ Test01.cpp -o Test01 } ; if ($?) { .\Test01
}
PS C:\Users\Admin>
PS C:\Users\Admin> cd "c:\Users\AdminPS CPSPSP
PS C:\Users\Admin>
PS C:\Users\Admin> cd "c:\Users\Admin\" ; if (
$?) { g++ Test01.cpp -o Test01 } ; if ($?) { .
\Test01 }
100
200.262
200.262
200.263
200.263
PS C:\Users\Admin> cd "c:\Users\Admin\" ; if (
$?) { g++ Test01.cpp -o Test01 } ; if ($?) { .
\Test01 }
100.000
200.262
200.262
200.263
PS C:\Users\Admin>
```

0 0 Blackbox Searching... Ln 10, Col 27 Spaces: 4 UTF-8 CRLF {} C++ Go Live Spell Win32 Formatting: ✓

File Edit Selection View Go Run ··· Test01.cpp - Visual Studio Code

Test01.cpp

C: > Users > Admin > Test01.cpp > main()

```cpp
using namespace std;

int main()
{
    // float or double
    double num1 = 100, num2 = 200.26242;

    // ---------
    cout.setf(ios::fixed);
    cout.setf(ios::showpoint);
    cout.precision(3);
    // مع التقريب لاقرب رقم عشري
    // With rounding to the nearest decimal place
    cout << num1 << endl;
    cout << num2 << endl;
    cout << 200.26202 << endl;
    cout << 200.26252 << endl;

    return 0;
}
```

TERMINAL

```
PS C:\Users\Admin> cd "c:\Users\Admin\" ; if ($?) { g++ Test01.cpp -o Test01 } ; if ($?) { .\Test01 }
100.000
200.262
200.262
200.263
PS C:\Users\Admin>
```

0 0 Blackbox Searching... Ln 8, Col 1 Spaces: 4 UTF-8 CRLF {} C++ Go Live Spell Win32 Formatting:

File Edit Selection View Go Run ··· Test01.cpp - Visual Studio Code

Test01.cpp

C: > Users > Admin > Test01.cpp > main()

```cpp
using namespace std;

int main()
{
    // float or double
    double num1 = 100, num2 = 200.26242;
    cout << num1 << endl;
    // ---------
    // cout.setf(ios::fixed);
    // cout.setf(ios::showpoint);
    cout.precision(3);
    // مع التقريب لاقرب رقم عشري
    // With rounding to the nearest decimal place
    cout << num2 << endl;
    cout << 200.26202 << endl;
    cout << 200.26252 << endl;
    return 0;
}
```

TERMINAL

```
PS C:\Users\Admin>
PS C:\Users\Admin> cd "c:\Users\Admin\" ; if ($?) { g++ Test01.cpp -o Test01 } ; if ($?) { .\Test01 }
100
200.262
200.262
200.263
200.263
PS C:\Users\Admin> cd "c:\Users\Admin\" ; if ($?) { g++ Test01.cpp -o Test01 } ; if ($?) { .\Test01 }
100.000
200.262
200.262
200.263
PS C:\Users\Admin> cd "c:\Users\Admin\" ; if ($?) { g++ Test01.cpp -o Test01 } ; if ($?) { .\Test01 }
100
200
200
200
PS C:\Users\Admin>
```

0 0 Blackbox Searching... Ln 4, Col 11 Spaces: 4 UTF-8 CRLF {} C++ Go Live Spell Win32 Formatting: ✓

File Edit Selection View Go Run ··· Test01.cpp - Visual Studio Code

Test01.cpp

C: > Users > Admin > Test01.cpp > main()

```cpp
using namespace std;

int main()
{
    // float or double
    double num1 = 100, num2 = 200.26242;
    cout << num1 << endl;
    // ---------
    // cout.setf(ios::fixed);
    cout.setf(ios::showpoint);
    cout.precision(3);
    // مع التقريب لاقرب رقم عشري
    // With rounding to the nearest decimal place
    cout << num2 << endl;
    cout << 200.26202 << endl;
    cout << 200.26252 << endl;

    return 0;
}
```

TERMINAL ··· Code

```
PS C:\Users\Admin> cd "c:\Users\Admin\" ; if ($?) { g++ Test01.cpp -o Test01 } ; if ($?) { .\Test01 }
100
200.262
200.262
200.263
PS C:\Users\Admin> cd "c:\Users\Admin\" ; if ($?) { g++ Test01.cpp -o Test01 } ; if ($?) { .\Test01 }
100
200.
200.
200.
PS C:\Users\Admin>
```

0 0 Blackbox Searching... Ln 4, Col 11 Spaces: 4 UTF-8 CRLF {} C++ Go Live Spell Win32 Formatting: ✓

File Edit Selection View Go Run ··· Test01.cpp - Visual Studio Code

Test01.cpp

C: > Users > Admin > Test01.cpp > main()

```cpp
using namespace std;

int main()
{
    // float or double
    double num1 = 100, num2 = 200.26242;
    cout << num1 << endl;
    // ---------
    cout.setf(ios::fixed);
    // cout.setf(ios::showpoint);
    cout.precision(3);
    // مع التقريب لاقرب رقم عشري
    // With rounding to the nearest decimal place
    cout << num2 << endl;
    cout << 200.26202 << endl;
    cout << 200.26252 << endl;

    return 0;
}
```

TERMINAL

```
PS C:\Users\Admin> cd "c:\Users\Admin\" ; if ($?) { g++ Test01.cpp -o Test01 } ; if ($?) { .\Test01 }
100
200.262
200.262
200.263
PS C:\Users\Admin> cd "c:\Users\Admin\" ; if ($?) { g++ Test01.cpp -o Test01 } ; if ($?) { .\Test01 }
100
200.
200.
200.
PS C:\Users\Admin> cd "c:\Users\Admin\" ; if ($?) { g++ Test01.cpp -o Test01 } ; if ($?) { .\Test01 }
100
200.262
200.262
200.263
PS C:\Users\Admin> SS
```

0 0 Blackbox Searching... Ln 5, Col 2 Spaces: 4 UTF-8 CRLF {} C++ Go Live Spell Win32 Formatting: ✓

File Edit Selection View Go Run Terminal Help Test01.cpp - Visual Studio Code

Test01.cpp

C: > Users > Admin > Test01.cpp > main()

```cpp
#include <iostream>
#include <iomanip> // for setprecision()
using namespace std;

int main()
{
    cout << fixed << setprecision(3) << 200.26252 << endl;
    return 0;
}
```

TERMINAL

```
PS C:\Users\Admin> cd "c:\Users\Admin\" ; if ($?) { g++ Test01.cpp -o Test01 } ; if ($?) { .\Test01 }
200.263
PS C:\Users\Admin>
```

0 0 Blackbox Searching... Ln 7, Col 36 Spaces: 4 UTF-8 CRLF {} C++ Go Live Spell Win32 Formatting: ✓

Input Using cin

- cin is an input stream bringing data from the keyboard
- The extraction operator (>>) removes data to be used

- Example:

```
cout << "Enter the number of bars in a package\n";
cout << " and the weight in ounces of one bar.\n";
cin >> numberOfBars;
cin >> oneWeight;
```

- This code prompts the user to enter data then reads two data items from cin
  - The first value read is stored in numberOfBars
  - The second value read is stored in oneWeight
  - Data is separated by spaces when entered

Reading Data From cin

- Multiple data items are separated by spaces
- Data is not read until the enter key is pressed
  - Allows user to make corrections

- Example:

```
cin >> v1 >> v2 >> v3;
```

  - Requires three space separated values
  - User might type

```
34  45  12   <enter key>
```

Designing Input and Output

- Prompt the user for input that is desired
  - cout statements provide instructions

```
cout << "Enter your age: ";
        cin >> age;
```

    - Notice the absence of a new line before using cin
- Echo the input by displaying what was read
  - Gives the user a chance to verify data

```
cout << age << " was entered." << endl;
```

Section 2.2 Conclusion

- Can you
  - write an input statement to place a value in the variable theNumber?
  - Write the output statement to prompt for the value to store in theNumber?
  - Write an output statement that produces a newline?
  - Format output of rational numbers to show 4 decimal places?

Notes

The main difference between C and C++

is that C++ support classes and objects
while C does not.

The general rules for naming variables are:

1. Names can contain letters, digits and underscores
2. Names must begin with a letter or an underscore (_)
3. Names are case sensitive (myVar and myvar are different variables)
4. Names cannot contain whitespaces or special characters like !, #, %, etc.
5. Reserved words (like C++ keywords, such as int) cannot be used as names

float vs. double

The precision of a floating point value indicates how many digits the value can have after the decimal point. The precision of float is only 6 or 7 decimal digits, while double variables have a precision of about 15 digits. Therefore it is safer to use double for most calculations.

```
float f1 = 35e3;
double d1 = 12E4;
cout << f1;
cout << d1;
```

Test01.cpp - Visual Studio Code

Test01.cpp

C: > Users > Admin > Test01.cpp > main()

```cpp
#include <iostream>
using namespace std;
int x = 20;
int main()
{
    int x = 10;
    cout << x;

    return 0;
}
```

Code

```
PS C:\Users\Admin> cd "c:\Users\Admin\" ;
 if ($?) { g++ Test01.cpp -o Test01 } ; i
f ($?) { .\Test01 }
10
PS C:\Users\Admin>
```

0 0 Blackbox Searching... UTF-8 CRLF {} C++ Go Live Spell Win32 Formatting: ✓

Test01.cpp - Visual Studio Code

Test01.cpp

C: > Users > Admin > Test01.cpp > main()

```cpp
#include <iostream>
using namespace std;
int x = 20;
int main()
{
    int x = 10;
    cout << ::x;

    return 0;
}
```

```
PS C:\Users\Admin> cd "c:\Users\Admin\" ; if ($?) { g++ Test01.cpp -o Test01 } ; if ($?) { .\Test01 }
20
PS C:\Users\Admin>
```

0 0 Blackbox Searching... UTF-8 CRLF {} C++ Go Live Spell Win32 Formatting: ×

Test01.cpp - Visual Studio Code

Test01.cpp

C: > Users > Admin > Test01.cpp > ...

```cpp
#include <iostream>
using namespace std;
int x = 20;
int main()
{
    int x = 10;
    cout << x << endl;
    cout << ::x << endl;

    return 0;
}
```

Global

Local

```
PS C:\Users\Admin> cd "c:\Users\Admin\" ; if ($?) { g++ Test01.cpp -o Test01 } ; if ($?) { .\Test01 }
10
20
PS C:\Users\Admin>
```

0 0 Blackbox Searching... UTF-8 CRLF {} C++ Go Live Spell Win32 Formatting: ✓

Test01.cpp - Visual Studio Code

Test01.cpp

C: > Users > Admin > Test01.cpp > main()

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

int main()
{
    const int x = 10;
    cout << x + 5 << endl;

    return 0;
}
```

Code

```
PS C:\Users\Admin> cd "c:\Users\Admin\" ; if ($?) { g++ Test01.cpp -o Test01 } ; if ($?) { .\Test01 }
15
PS C:\Users\Admin>
```

0 0 Blackbox Searching... UTF-8 CRLF {} C++ Go Live Spell Win32 Formatting: ✓

Test01.cpp - Visual Studio Code

Test01.cpp 1

C: > Users > Admin > Test01.cpp > main()

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

int main()
{
    const int x = 10;
    cout << x + 5 << endl;
    x = 5;    expression must be
    return 0;
}
```

```
PS C:\Users\Admin> cd "c:\Users\Admin\" ;
 if ($?) { g++ Test01.cpp -o Test01 } ; i
f ($?) { .\Test01 }
15
PS C:\Users\Admin>
```

1 0 Blackbox Searching... UTF-8 CRLF {} C++ Go Live Spell Win32 Formatting: ✓

Test01.cpp - Visual Studio Code

Test01.cpp

C: > Users > Admin > Test01.cpp > main()

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

int main()
{
    int x = 10;
    cout << x << endl;
    x = 6;
    cout << x << endl;
    return 0;
}
```

```
PS C:\Users\Admin> cd "c:\Users\Admin\" ; if ($?) { g++ Test01.cpp -o Test01 } ; if ($?) { .\Test01 }
15
PS C:\Users\Admin> cd "c:\Users\Admin\" ; if ($?) { g++ Test01.cpp -o Test01 } ; if ($?) { .\Test01 }
10
6
PS C:\Users\Admin>
```

0 0 Blackbox Searching... UTF-8 CRLF {} C++ Go Live Spell Win32 Formatting: ✓

Test01.cpp - Visual Studio Code

Test01.cpp

C: > Users > Admin > Test01.cpp > main()

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

int main()
{
    static int x = 10;
    cout << x << endl;
    x = 6;
    cout << x << endl;
    return 0;
}
```

```
PS C:\Users\Admin> cd "c:\Users\Admin\" ; if ($?) { g++ Test01.cpp -o Test01 } ; if ($?) { .\Test01 }
10
6
PS C:\Users\Admin>
```

0 0 Blackbox Searching... UTF-8 CRLF {} C++ Go Live Spell Win32 Formatting: ✓

ترتيبيب العمليات ف المعادلة

1- الارقام داخل ال ()
2- * - / - %
3- +
4- -

ناتج ضرب او جمع رقمين مختلفين

1- Int*int=int
2- Int*float=float
3- Int*float*double=double

Thanks