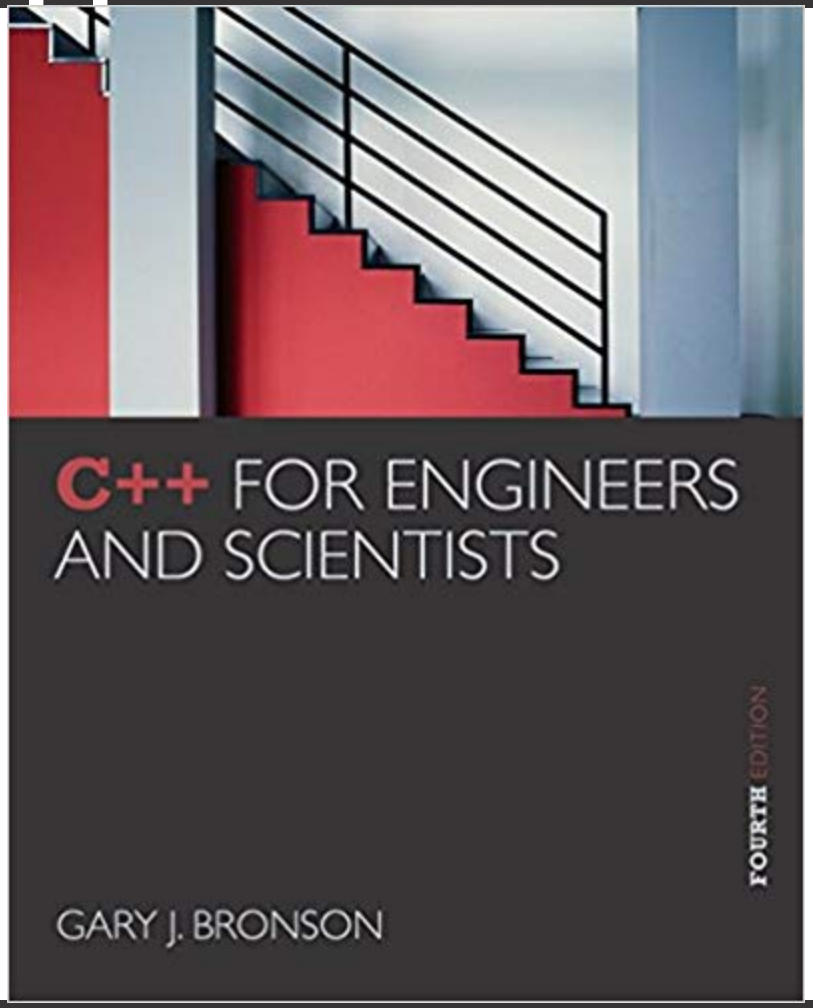
ELEG 1043
Computer Applications in Engineering



Chapter 2:
Problem Solving Using C++

Acknowledgement

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Comments

Example:

```
// this program displays a message
#include <iostream>
using namespace std;

int main ()
{
   //displays text
   cout << "Hello there world!";
     return 0;
}
```

Arithmetic Operations (continued)

Program 2.6

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

int main()
{
  cout << "15.0 plus 2.0 equals "        << (15.0 + 2.0) << endl
       << "15.0 minus 2.0 equals "       << (15.0 - 2.0) << endl
       << "15.0 times 2.0 equals "       << (15.0 * 2.0) << endl
       << "15.0 divided by 2.0 equals "  << (15.0 / 2.0) << endl;

  return 0;
}
```

Memory Allocation (continued)

- Declaring a variable causes memory to be allocated based on the data type

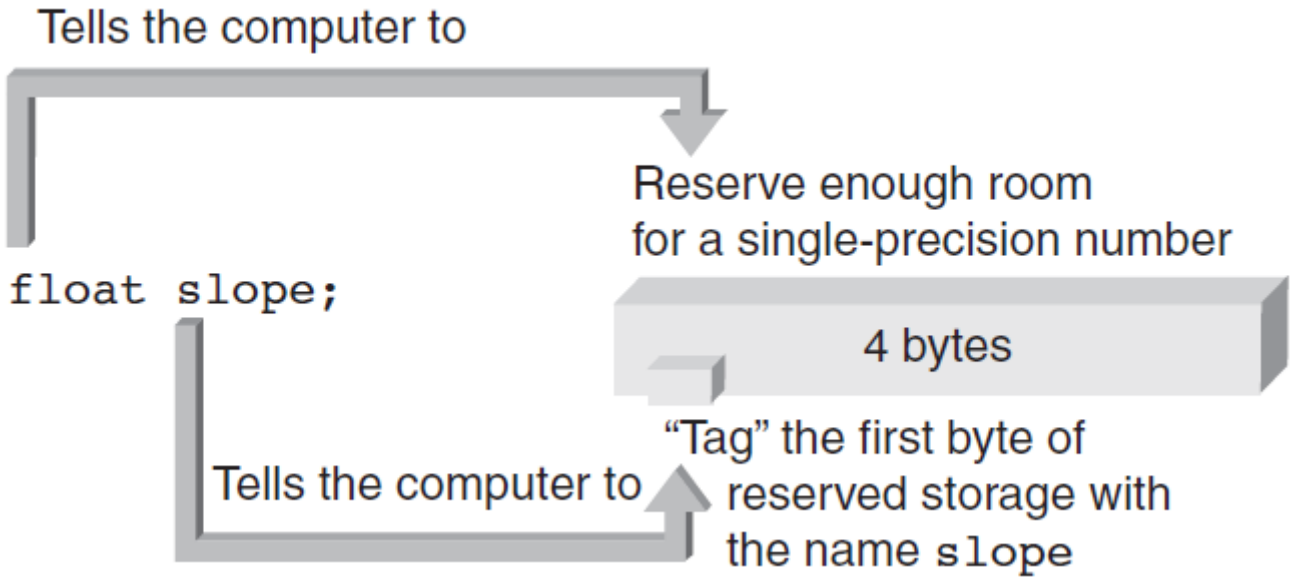

Figure 2.10b Defining the floating-point variable named `slope`

Memory Allocation (continued)

Program 2.10

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

int main()
{
   int num;

   num = 22;
   cout << "The value stored in num is " << num << endl;
   cout << "The address of num = " << &num << endl;

   return 0;
}
```

A Case Study: Radar Speed Trap

- Step 1: Analyze the Problem
  - Understand the desired outputs
  - Determine the required inputs
- Step 2: Develop a Solution
  - Determine the algorithms to be used
  - Use top-down approach to design
- Step 3: Code the Solution
- Step 4: Test and Correct the Program

A Case Study: Radar Speed Trap (continued)

- Analyze the Problem
  - Output: Speed of the car
  - Inputs: Emitted frequency and received frequency
- Develop a Solution
  - Algorithm:
    - Assign values to f0 and f1
    - Calculate and display speed

A Case Study: Radar Speed Trap (continued)

- Code the Solution

Program 2.11

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

int main()
{
  double speed, fe, fr;

  fe = 2e10;
  fr = 2.0000004e10;

  speed = 6.685e8 * (fr - fe) / (fr + fe);
  cout << "The speed is " << speed << " miles/hour " << endl;

  return 0;
}
```