C++ 기초 문법

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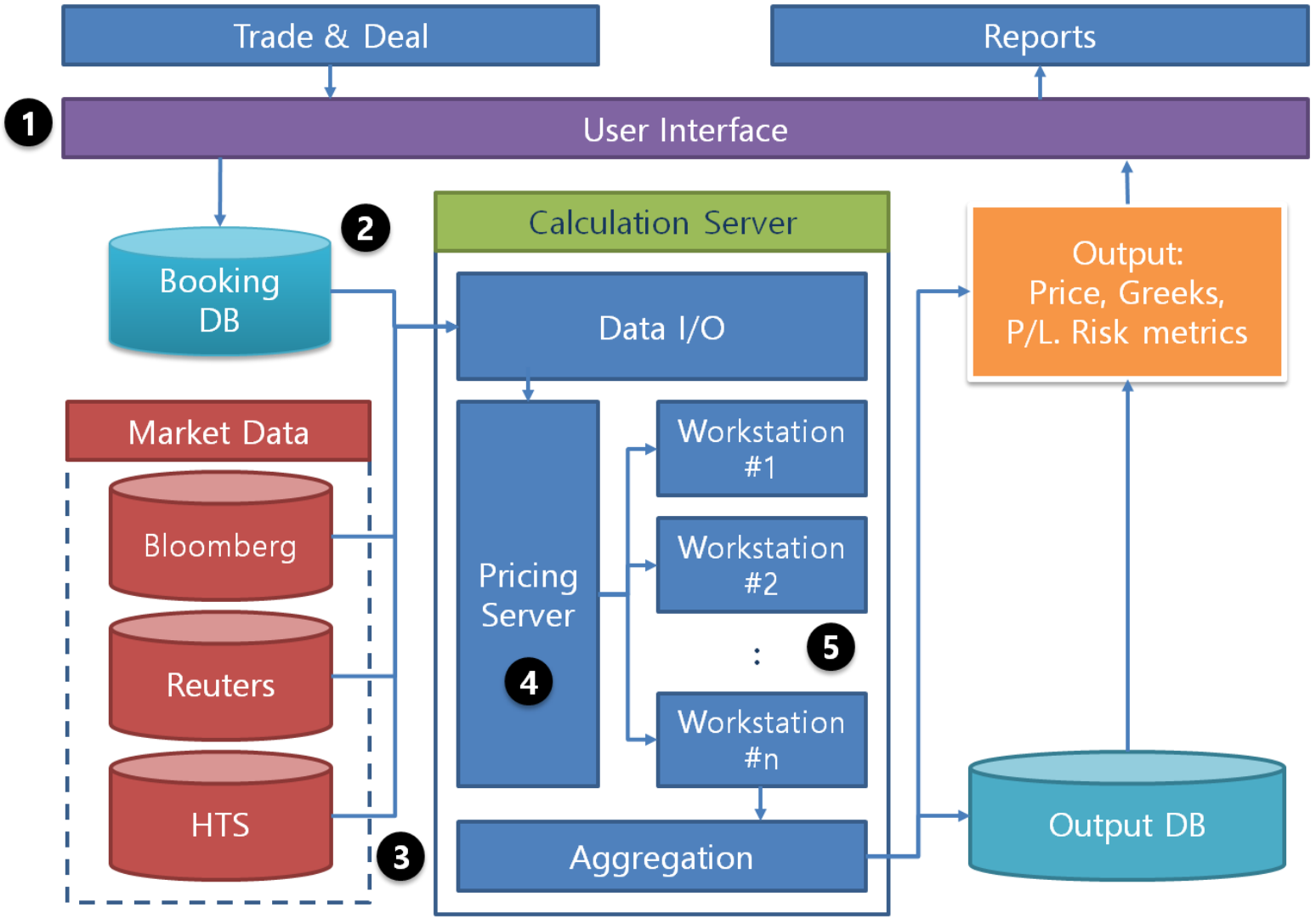
Programming for Financial Engineering



Getting Started with C++

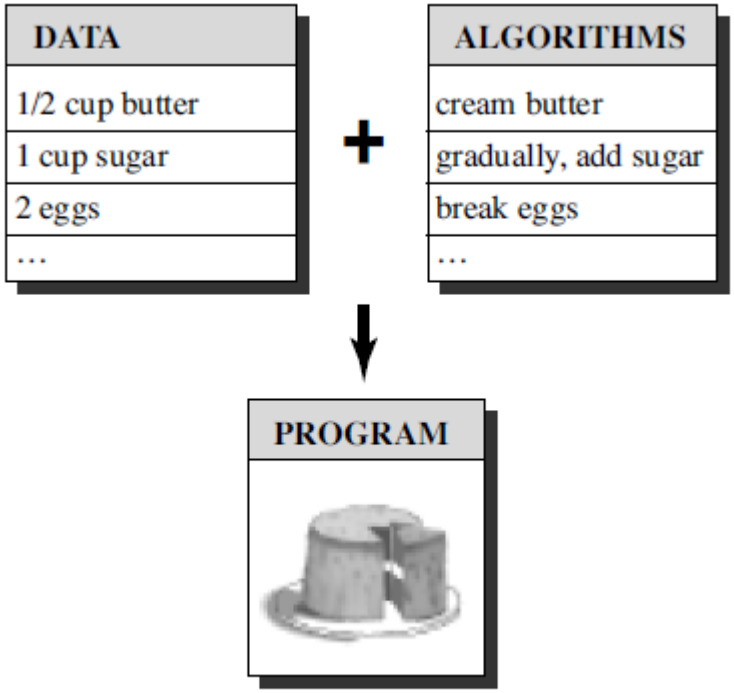


Figure 1.1 Data + algorithms = program.

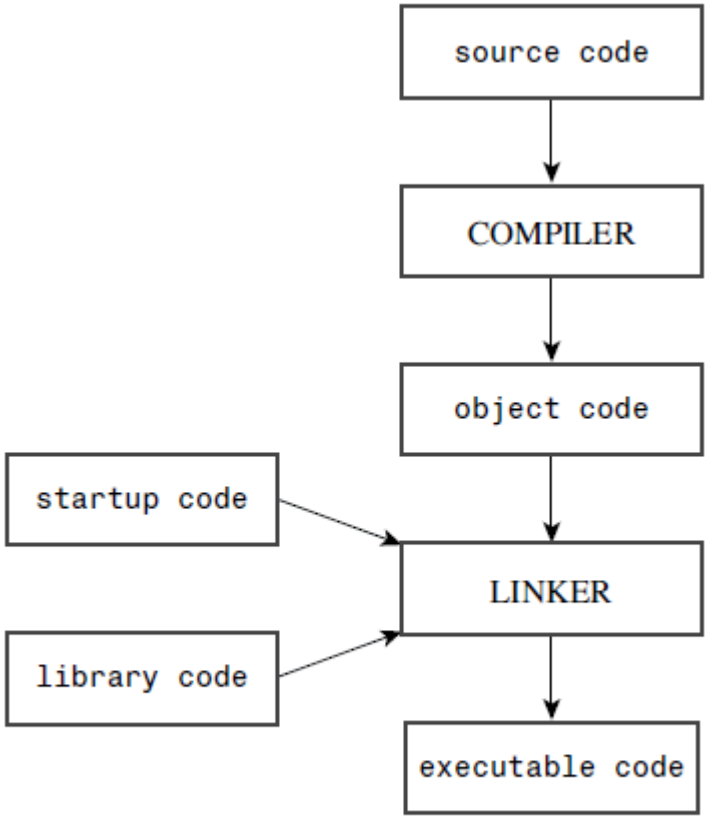


Figure 1.3 Programming steps.

Setting Out to C++

Listing 2.1 **myfirst.cpp**

```
// myfirst.cpp -- displays a message

#include <iostream>                          // a PREPROCESSOR directive
int main()                                   // function header
{                                            // start of function body
    using namespace std;                     // make definitions visible
    cout << "Come up and C++ me some time."; // message
    cout << endl;                           // start a new line
    cout << "You won't regret it!" << endl; // more output
    return 0;                               // terminate main()
}                                            // end of function body
```

- ❖ 함수 Function
- ❖ 주석 Comments
- ❖ 전처리기 Preprocessor
- ❖ 헤더파일 Header
- ❖ 이름공간 Namespaces
- ❖ 객체 Object
- ❖ 연산자 Operator
- ❖ 문자열 String
- ❖ 토큰 Tokens
- ❖ 화이트스페이스 White Space

Setting Out to C++

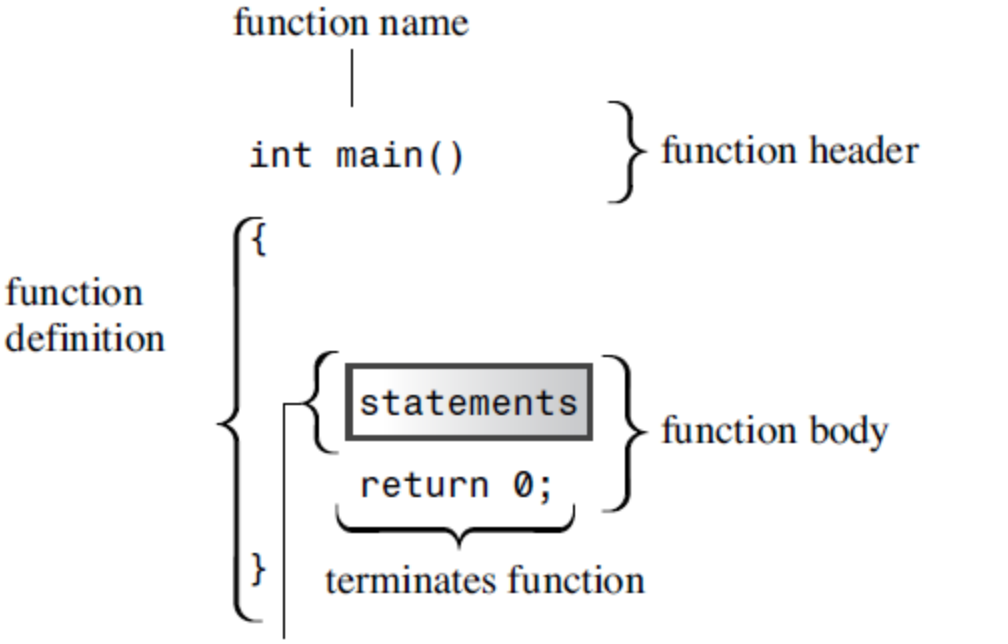


Figure 2.1 The `main()` function.

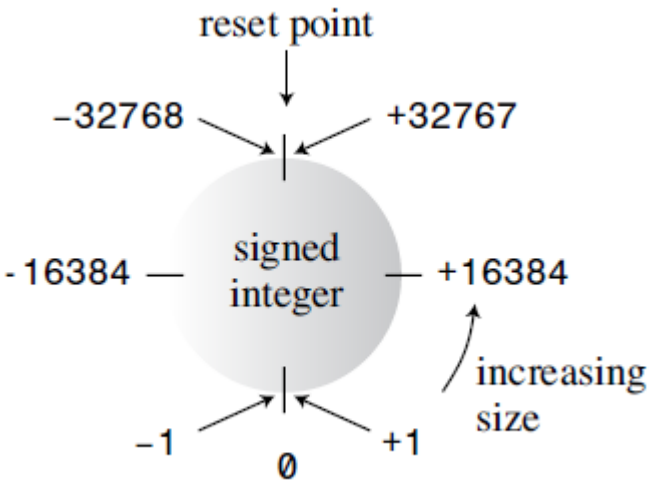
Listing 2.2 **carrots.cpp**

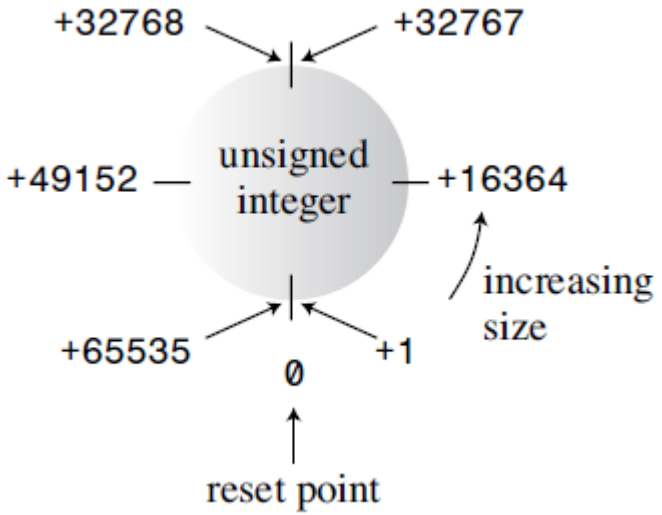
```
// carrots.cpp -- food processing program
// uses and displays a variable

#include <iostream>

int main()
{
    using namespace std;

    int carrots;            // declare an integer variable

    carrots = 25;            // assign a value to the variable
    cout << "I have ";
    cout << carrots;        // display the value of the variable
    cout << " carrots.";
    cout << endl;
    carrots = carrots - 1;  // modify the variable
    cout << "Crunch, crunch. Now I have " << carrots << " carrots." << endl;
    return 0;
}
```

- ❖ 선언 Declare
- ❖ 대입 Assign
- ❖ 변수 Variable
- ❖ 수정 Modify

Integer Types

- A `short` integer is at least 16 bits wide.
- An `int` integer is at least as big as `short`.
- A `long` integer is at least 32 bits wide and at least as big as `int`.
- A `long long` integer is at least 64 bits wide and at least as big as `long`.





Floating Point Numbers

- float
- double
- long double

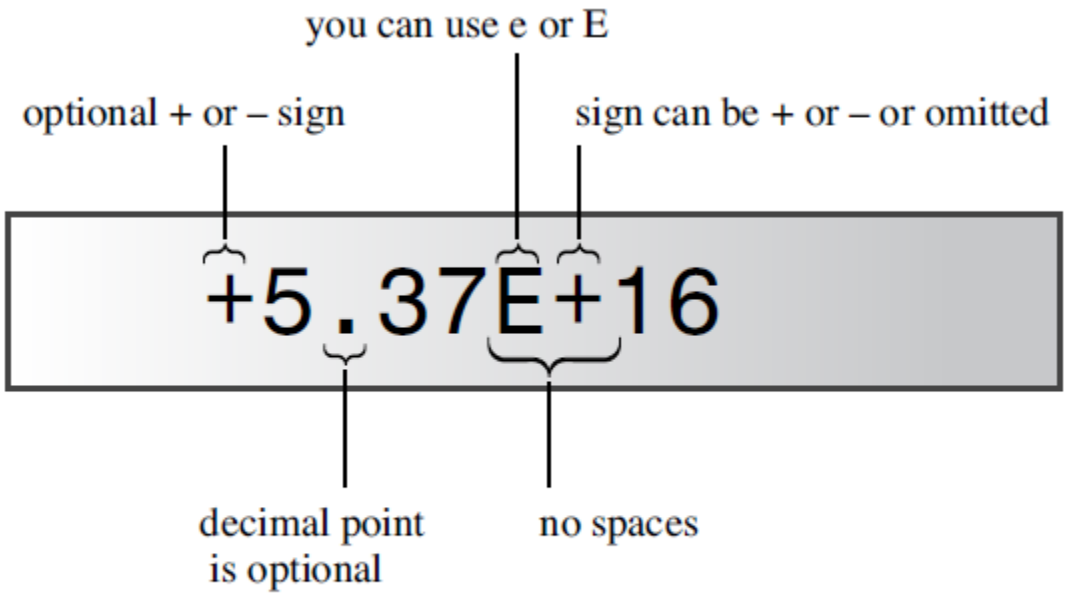


Figure 3.3 E notation.

입력과 출력 **cin & cout**

Listing 2.3 **getinfo.cpp**

```
// getinfo.cpp -- input and output
#include <iostream>

int main()
{
    using namespace std;

    int carrots;

    cout << "How many carrots do you have?" << endl;
    cin >> carrots;                 // C++ input
    cout << "Here are two more. ";
    carrots = carrots + 2;
// the next line concatenates output
    cout << "Now you have " << carrots << " carrots." << endl;
    return 0;
}
```

함수 **Function**

❖ 함수 호출

- X = sqrt(6.25);

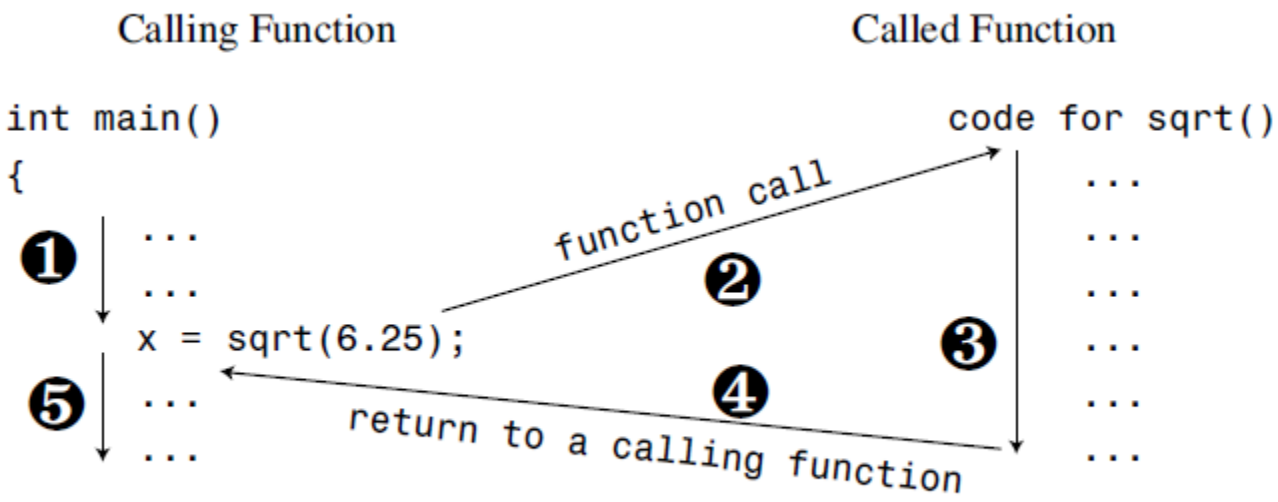


Figure 2.6 Calling a function.

Function 호출 문법

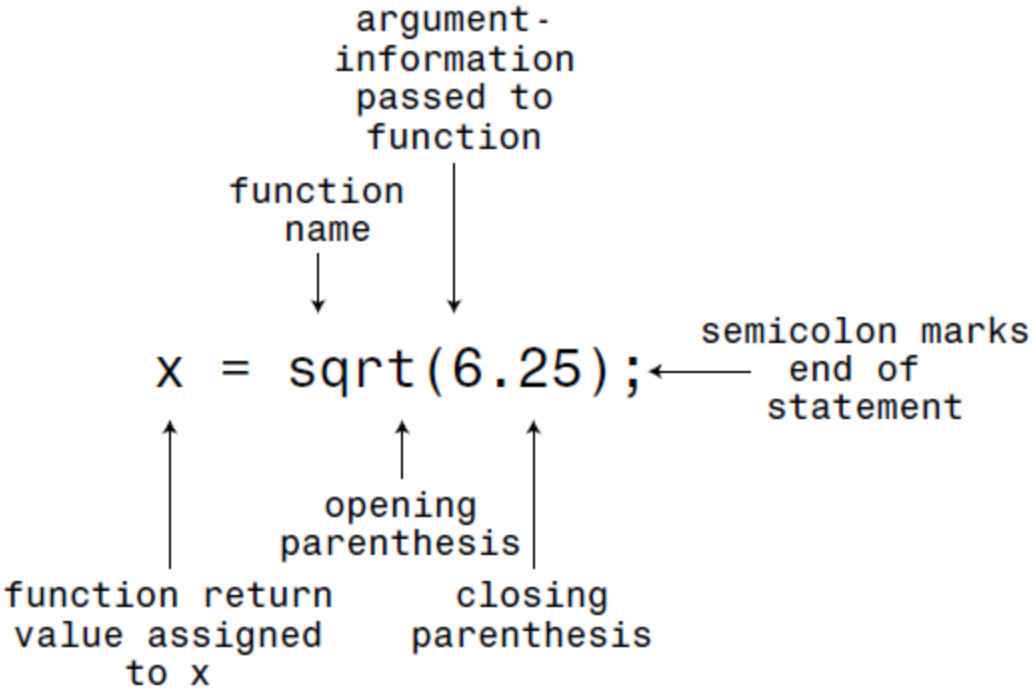


Figure 2.7 Function call syntax.

사용자 정의 함수

Listing 2.5 **ourfunc.cpp**

```
// ourfunc.cpp -- defining your own function
#include <iostream>
void simon(int);    // function prototype for simon()

int main()
{
    using namespace std;
    simon(3);       // call the simon() function
    cout << "Pick an integer: ";
    int count;
    cin >> count;
    simon(count);   // call it again
    cout << "Done!" << endl;
    return 0;
}

void simon(int n)   // define the simon() function
{
    using namespace std;
    cout << "Simon says touch your toes " << n << " times." << endl;
}                   // void functions don't need return statements
```

```
type functionname(argumentlist)
{
    statements
}
```

리턴 타입이 있는 함수

Listing 2.6 **convert.cpp**

```
// convert.cpp -- converts stone to pounds
#include <iostream>
int stonetolb(int);     // function prototype
int main()
{
    using namespace std;
    int stone;
    cout << "Enter the weight in stone: ";
    cin >> stone;
    int pounds = stonetolb(stone);
    cout << stone << " stone = ";
    cout << pounds << " pounds." << endl;
    return 0;
}

int stonetolb(int sts)
{
     return 14 * sts;
}
```

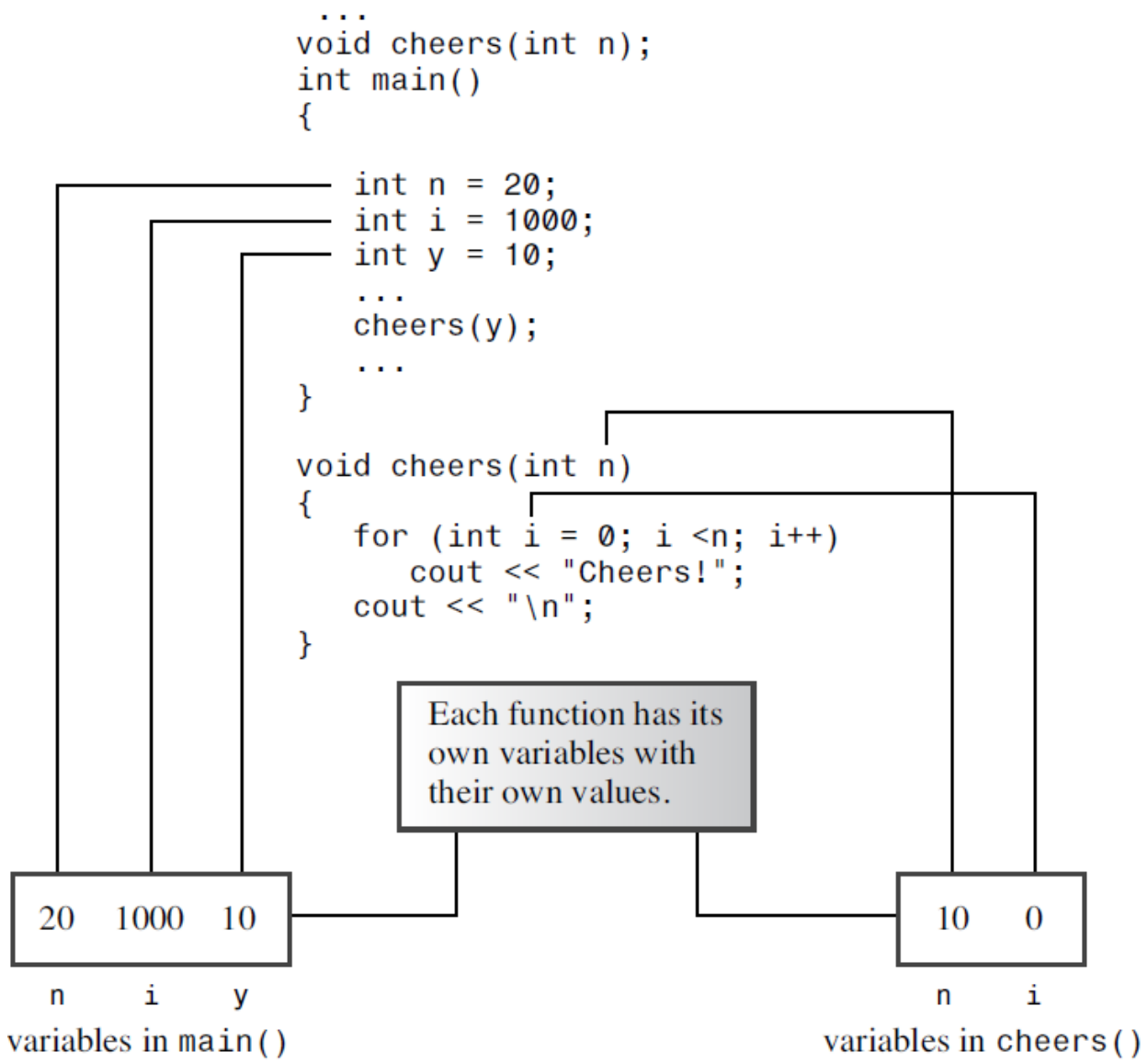
Default arguments

```
int harpo(int n, int m = 4, int j = 5);          // VALID
int chico(int n, int m = 6, int j);              // INVALID
int groucho(int k = 1, int m = 2, int n = 3);    // VALID
```

For example, the `harpo()` prototype permits calls with one, two, or three arguments:

```
beeps = harpo(2);        // same as harpo(2,4,5)
beeps = harpo(1,8);      // same as harpo(1,8,5)
beeps = harpo (8,7,6);   // no default arguments used
```

Local variables



구조체

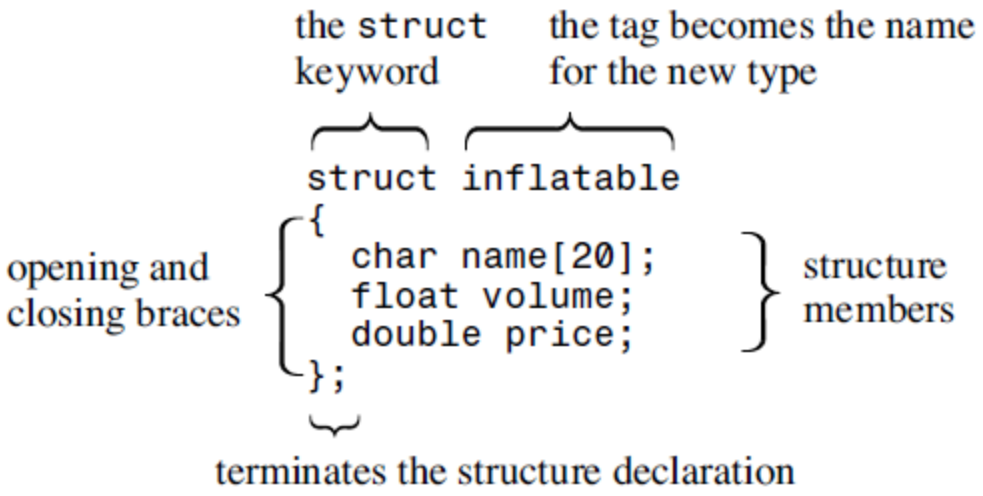


Figure 4.6 Parts of a structure description.

```
int main()
{
    using namespace std;
    inflatable guest =
    {
        "Glorious Gloria",  // name value
        1.88,               // volume value
        29.99               // price value
    };  // guest is a structure variable of type inflatable
// It's initialized to the indicated values
    inflatable pal =
    {
        "Audacious Arthur",
        3.12,
        32.99
    };  // pal is a second variable of type inflatable
// NOTE: some implementations require using
// static inflatable guest =

    cout << "Expand your guest list with " << guest.name;
    cout << " and " << pal.name << "!\n";
// pal.name is the name member of the pal variable
    cout << "You can have both for $";
    cout << guest.price + pal.price << "!\n";
    return 0;
}
```

Q & A