5   Local Variables

- Variables declared in a function:
  - Are local to that function, they cannot be used from outside the function
  - Have the function as their scope
- Variables declared in the main part of a program:
  - Are local to the main part of the program, they cannot be used from outside the main part
  - Have the main part as their scope

5.1   Global Constants

- Global Named Constant
  - Available to more than one function as well as the main part of the program
  - Declared outside any function body
  - Declared outside the main function body
  - Declared before any function that uses it
- Example:
```cpp
const double PI = 3.14159;
double volume(double);
int main() {
:
:
}
```
  - PI is available to the main function and to function volume

5.2   Global Variables

- Global Variable – rarely used when more than one function must use a common variable
  - Declared just like a global constant except const is not used
  - Generally make programs more difficult to understand and maintain

5.3   Formal Parameters are Local Variables

- Formal Parameters are actually variables that are local to the function definition
  - They are used just as if they were declared in the function body
  - Do NOT re-declare the formal parameters in the function body, they are declared in the function declaration
- The call-by-value mechanism
  - When a function is called the formal parameters are initialized to the values of the arguments in the function call

5.4   Namespaces Revisited

- The start of a file is not always the best place for
```cpp
using namespace std;
```

- Different functions may use different namespaces
  - Placing **using namespace std;** inside the starting brace of a function
    * Allows the use of different namespaces in different functions
    * Makes the "using" directive local to the function