

Chapter 1 Overview of C++

Chapter 1 Topics

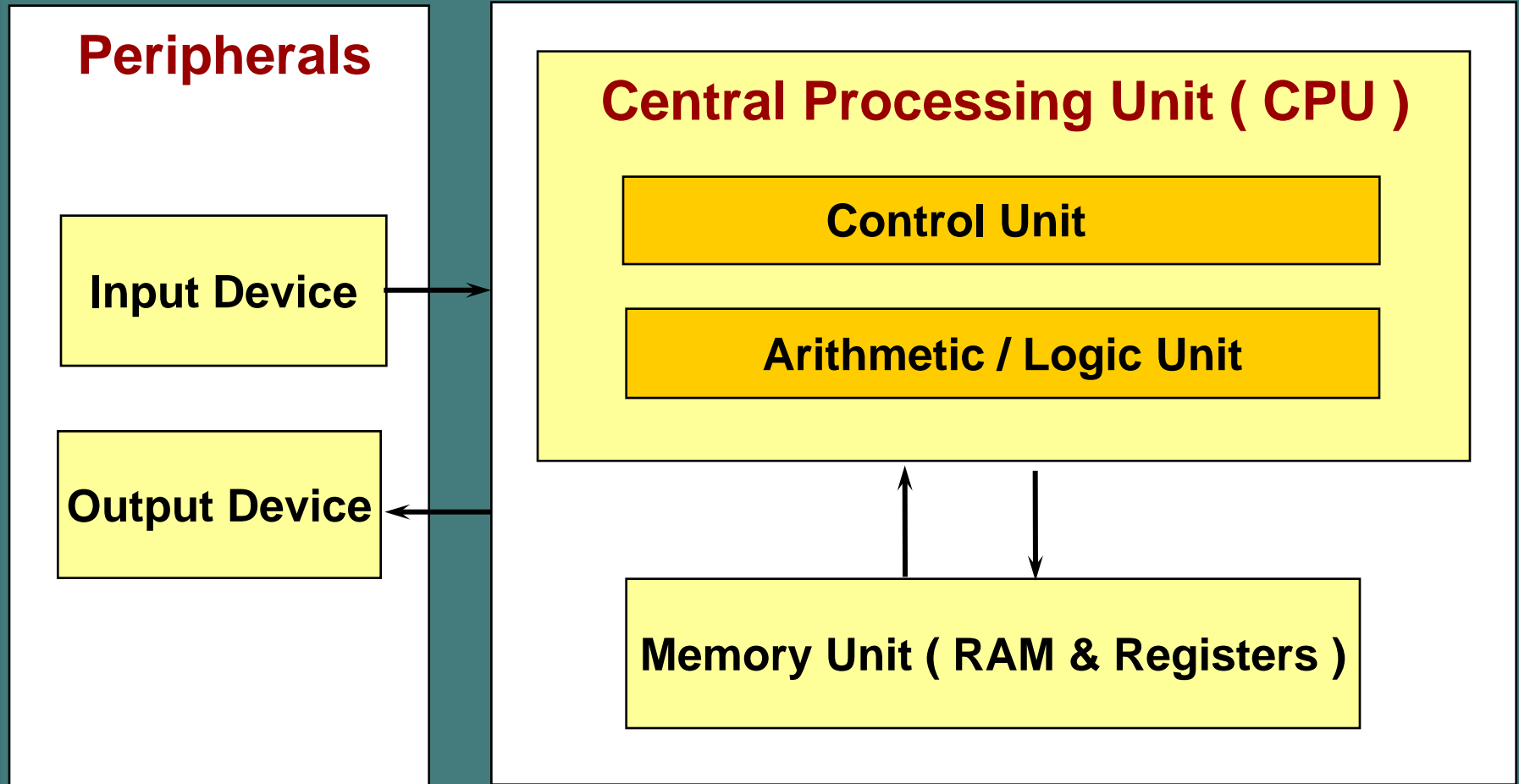
- ❖ Computer Programming

- ❖ C++ History

- ❖ Program Construction

- ❖ Compilation and Execution Processes

Computer Components



What is Computer Programming?

- ❖ It is the process of planning a sequence of steps (called instructions) for a computer to follow.

STEP 1

STEP 2

STEP 3

...

What is a Programming Language?

- ❖ It is a language with strict grammar rules, symbols, and special words used to construct a computer program.

Machine Language

- ❖ is not portable
- ❖ runs only on specific type of computer
- ❖ is made up of binary-coded instructions (strings of 0s and 1s)
- ❖ is the language that can be directly used by the computer

High Level Languages

- ❖ **are portable**



International Standards
Organization / American
National Standards
Institute

- ❖ **user writes program in language** ○ **similar to natural language**

- ❖ **most are standardized by ISO/ANSI to provide an official description of the language**

- ❖ **examples ---**

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Some C++ History

- ❖ 1972 : Dennis Ritchie at Bell Labs designs C
- ❖ Late 70's : OOP becomes popular
- ❖ Early 80's: Bjarne Stroustrup at Bell Labs adds features to C to form “C with Classes”
- ❖ 1983 : Name C++ first used
- ❖ 1998 : ISO/ANSI standardization of C++
- ❖ 2014: Current standard, C++14

Object-Oriented Programming

Bjarne Stroustrup



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A C++ program is a collection of one or more functions

- ❖ there must be a function called `main()`
- ❖ execution always begins with the first statement in function `main()`
- ❖ any other functions in your program are subprograms and are not executed until they are called

An Example:

Program with Three Functions



The diagram consists of a large dashed rectangular box containing three smaller solid rectangular boxes stacked vertically. Each box contains text representing a function in a program.

main function

square function

cube function

Object-Oriented Programming

```
#include <iostream>           // preprocessor directive

int Square( int );           // declares these two
int Cube( int );             // value-returning functions

using namespace std ;

int main( )
{
    cout << "The square of 2 is "
          << Square(2) << endl;           // function call
    cout << "The cube of 2 is "
          << Cube(2) << endl;           // function call
    return 0;
}

int Square( int n )
{
    return n * n;
}

int Cube( int n )
{
    return n * n * n;
}
```

Output of program

The square of 2 is 4

The cube of 2 is 8

Every C++ function has 2 parts

```
int Square ( int n )
```

```
{
```

```
    return n * n ;
```

```
}
```

—— heading

> body block

What is in a heading?

type of returned value

name of function

formal parameter list



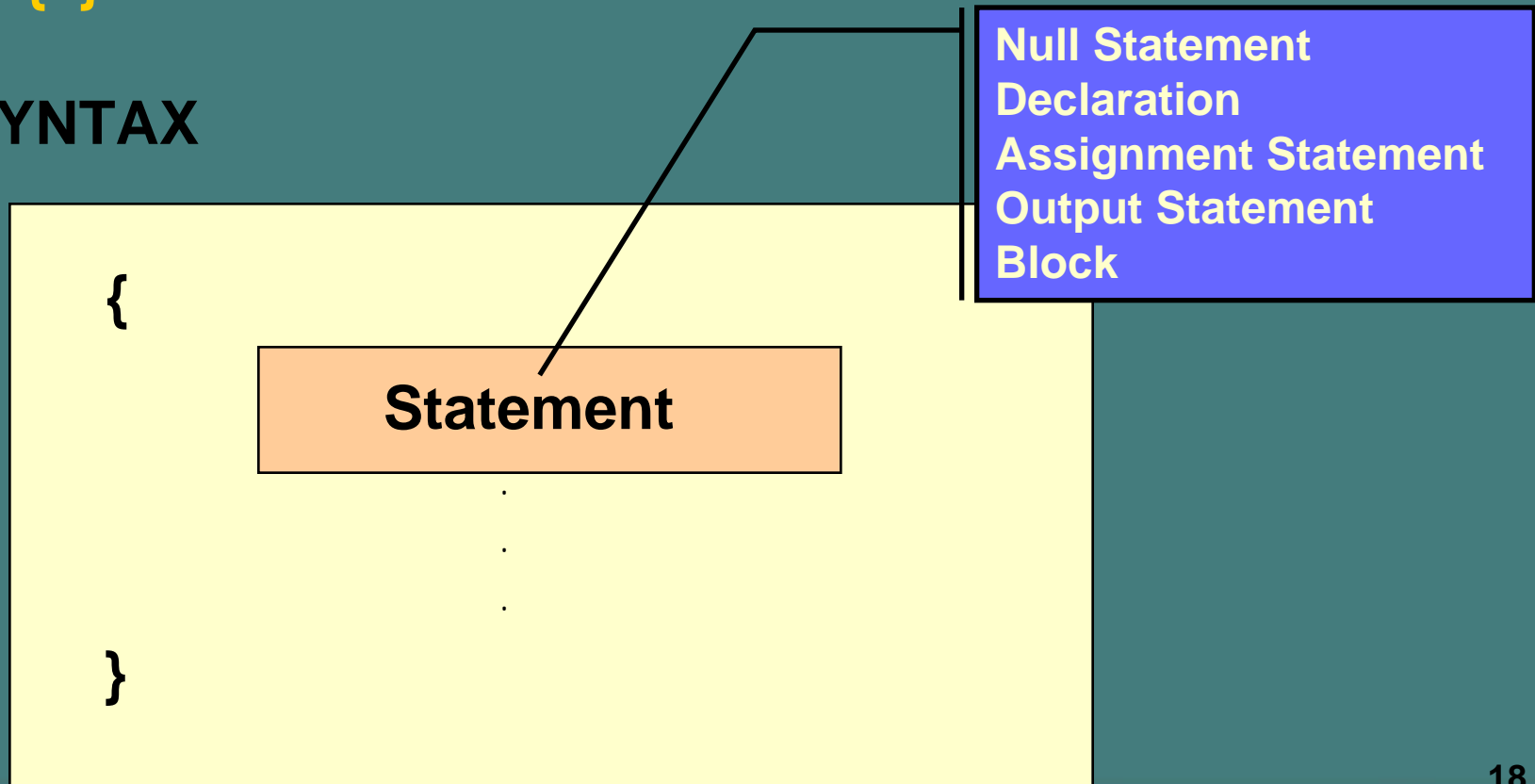
The diagram shows a function heading 'int Square (int n)' on a yellow background. Three labels are positioned above the heading with lines pointing to specific parts: 'type of returned value' points to 'int', 'name of function' points to 'Square', and 'formal parameter list' points to '(int n)'.

```
int Square ( int n )
```

Block (Compound Statement)

- ❖ a block is a sequence of zero or more statements enclosed by a pair of curly braces
{ }

SYNTAX



Shortest C++ Program

type of returned value

name of function

says no parameters

```
int main ( )
```

```
{
```

```
    return 0;
```

```
}
```

body block

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Three C++ Program Stages

