Jiangxi University of Science and Technology

Ch01 Introduction to Computer Programming

Lecture0102 Algorithm and Software Development

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Jiangxi Ganzhou

MY WECHAT ID

2019lecture

THE C PROGRAMMING LANGUAGE

Our Lecture WE CHAT ID

2.1 Introduction to C Programming

THE C PROGRAMMING LANGUAGE

➢ Function (函数)

- ***Modular programs*** are easier to develop, correct, and modify than programs constructed in some other manner.
- In C, modules can be ***functions***.

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- **Function (函数)**

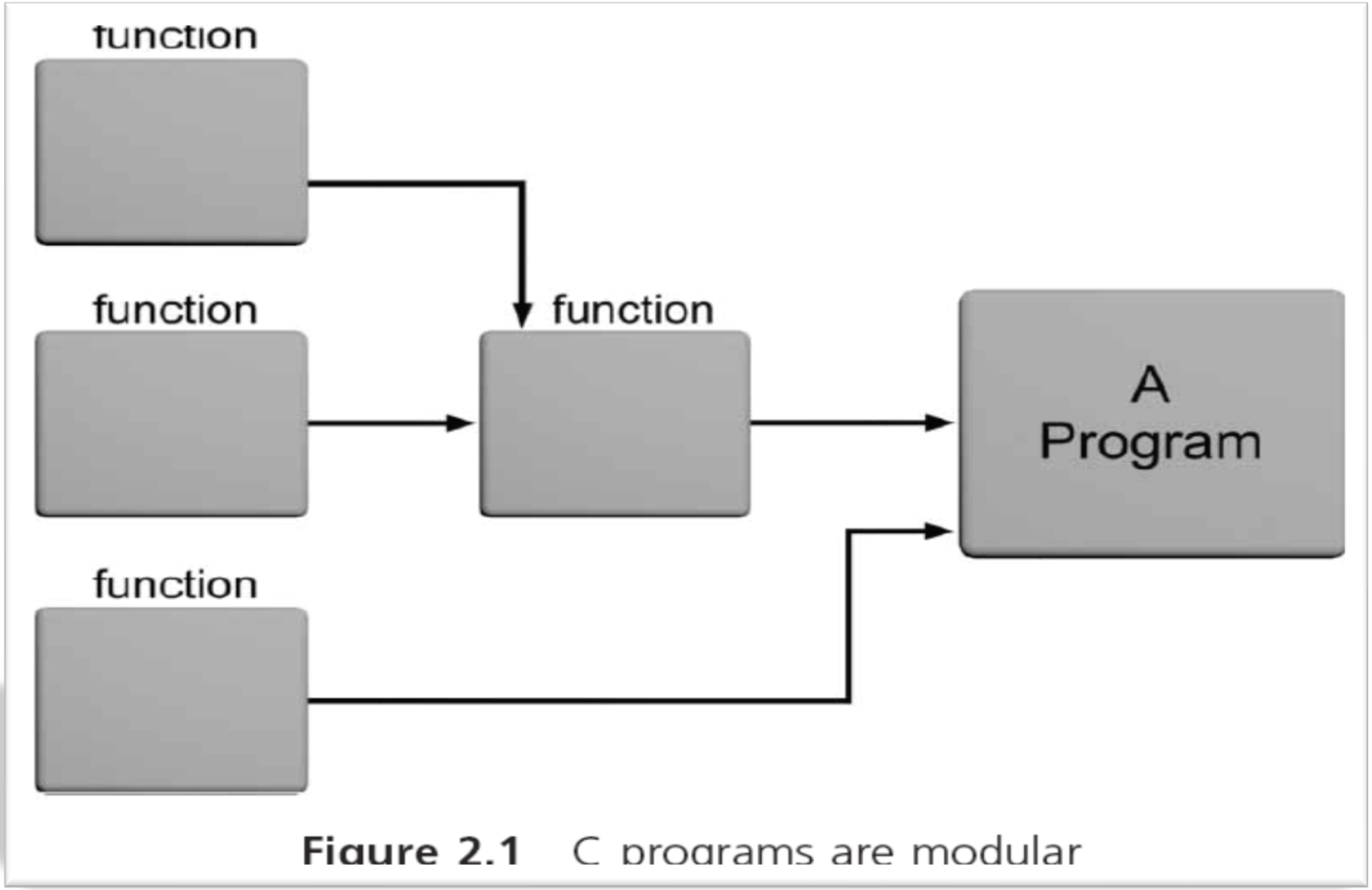

Figure 2.1 C programs are modular

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- Function (函数)
  - A function is composed of a sequence of C language instructions.
  - It helps to think of a function as ***a small machine*** that transforms the data it receives into a finished product.

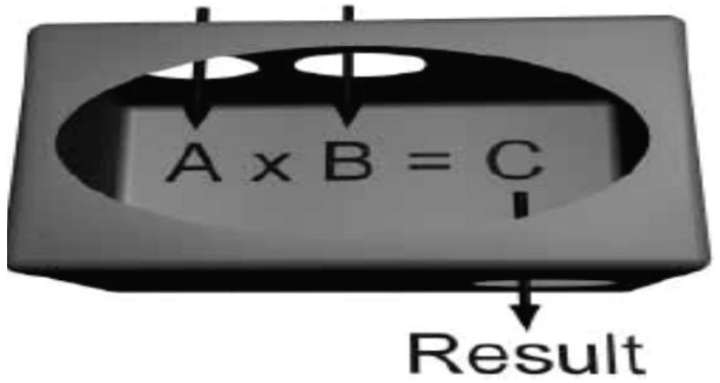

Figure 2.2 A multiplying function

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- C provides a set of functions
  - Stored in a set of files known as the ***standard library*** (标准库)
  - The standard library consists of 15 ***header files*** (头文件)
  - printf("the circumference of the circle is %f\n", circumference);
  - It’s header file is ***stdio.h***

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- Identifiers (标识符) in C consist of three types:
  I. **Reserved words** (保留字)
  II. **Standard identifiers** (标准标识符)
  III. **Programmer-created identifiers** (程序员创建的标识符)

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I. Reserved word

- word that is predefined by the programming language for a special purpose and can only be used in a specified manner for its intended purpose
- Also referred to as **keywords** in C

Table 2.1 Keywords

auto	default	float	register	struct	volatile
break	do	for	return	switch	while
case	double	goto	short	typedef	
char	else	if	signed	union	
const	enum	int	sizeof	unsigned	
continue	extern	long	static	void	

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II. Standard identifiers

- words predefined in C
- Most of the standard identifiers are the names of functions that are provided in the C standard library

Table 2.2 Sample of C Standard Identifiers

abs	fopen	isalpah	rand	strcpy
argc	free	malloc	rewind	strlen
argv	fseek	memcpy	scanf	tolower
calloc	gets	printf	sin	toupper
fclose	isacii	puts	strcat	ungetc

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III. Programmer-created identifiers

- Used for naming data and functions
- Must conform to **C's identifier rules**
- Can be any combination of **letters**, **digits**, or **underscores** _ subject to the following rules:

1. First character must be a letter or underscore
2. Only letters, digits, or underscores may follow the initial character
3. Blank spaces are not allowed
4. Cannot be a reserved word

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- C programmer-created names
  - Those **identifiers**, such as ***4ab7***, ***e*6***, and ***while*** are **invalid.**
  - All **uppercase letters** used to indicate a **constant**
  - A function name must be followed by **parentheses**
  - An identifier should be descriptive.
    - Bad identifier choices: easy, duh, justDoIt
  - C is a **case-sensitive** language
    - TOTAL, and total represent different identifiers

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- The ***main()*** Function

Sometimes referred to as a **driver function**

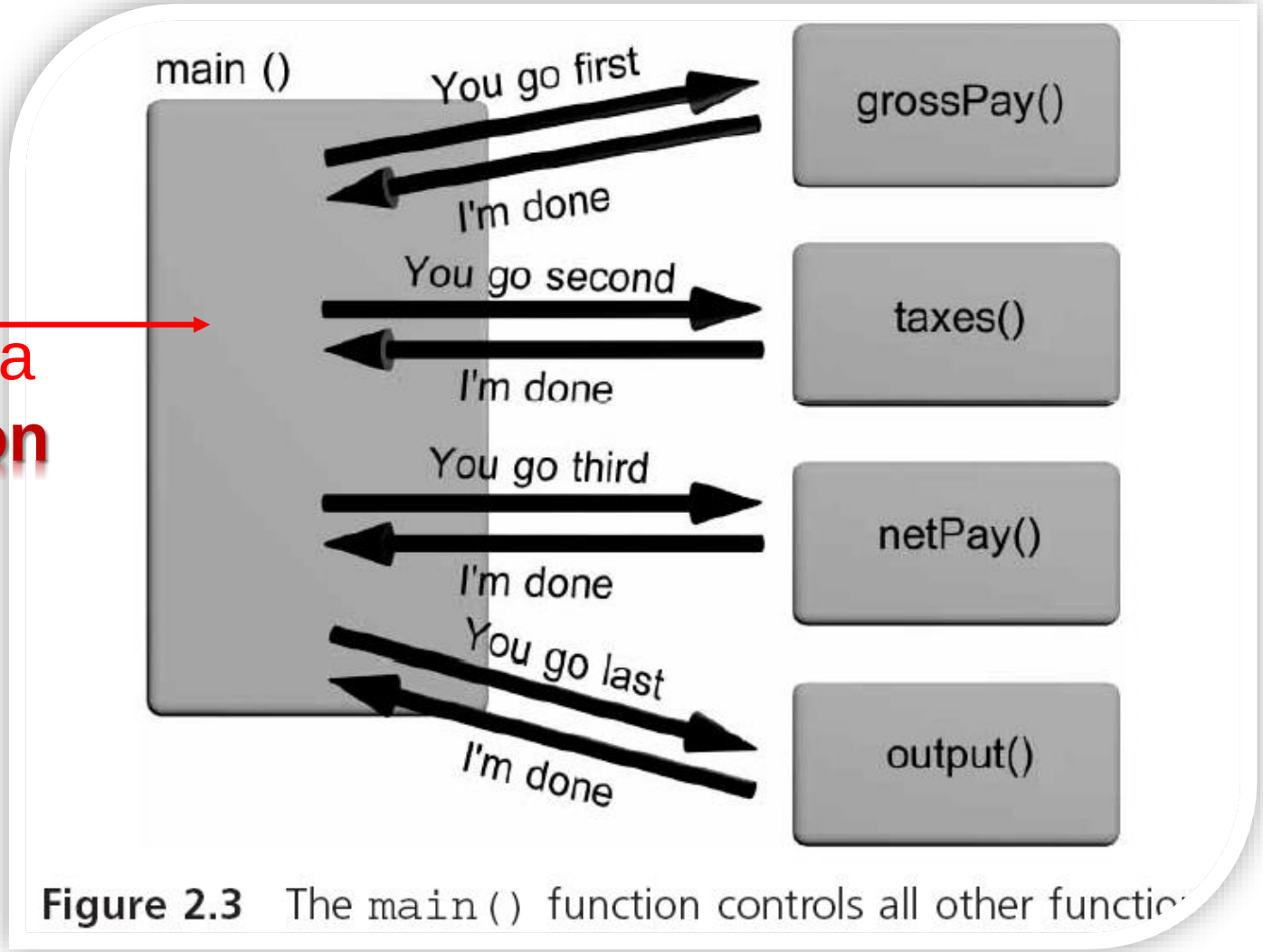

Figure 2.3 The `main()` function controls all other functio

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- The ***main()*** Function

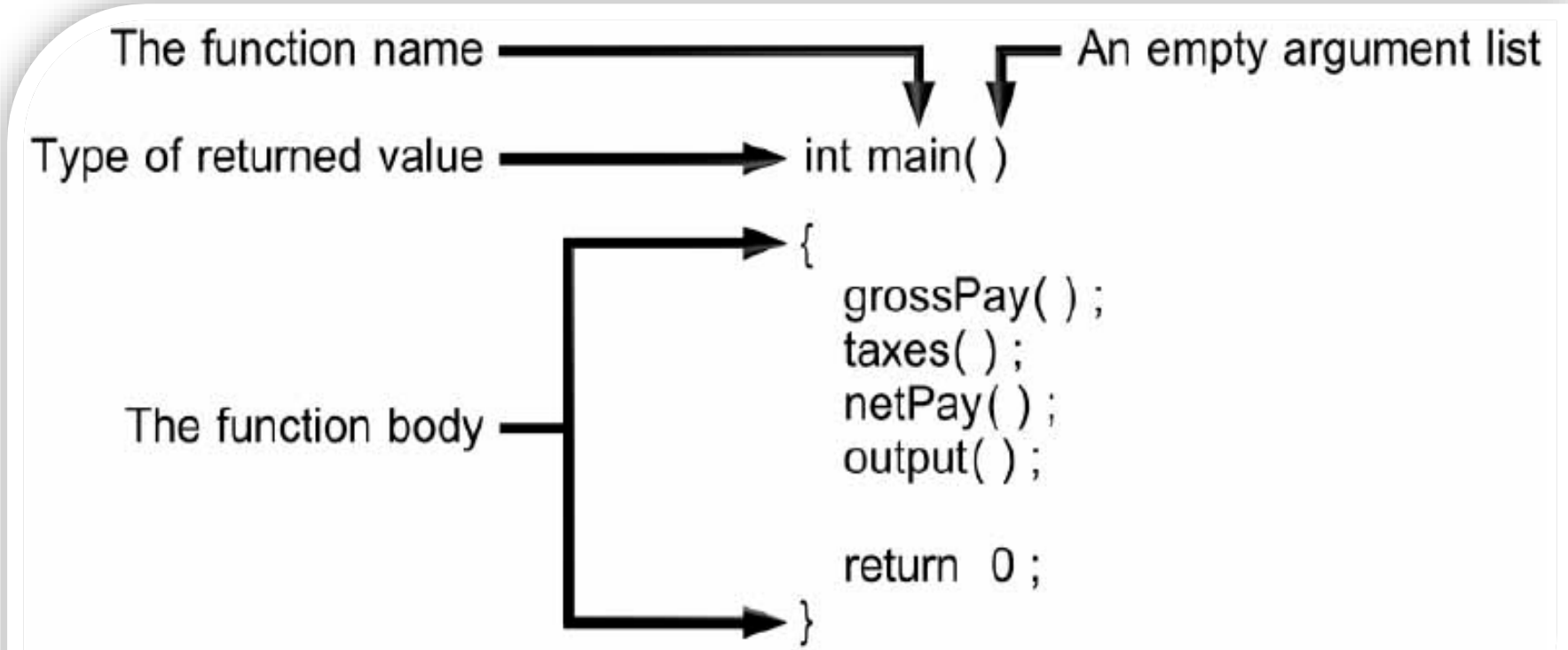

Figure 2.4 A sample `main()` function

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- The ***printf()*** Function
  - **printf()** formats data and sends it to the standard system display device (i.e., the monitor)
  - Inputting data or messages to a function is called **passing data** to the function
  - Messages are known as **strings** in C, A string of characters is surrounded by double quotes
  - **printf**(**"Hello there world!"**);

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- The ***printf()*** Function

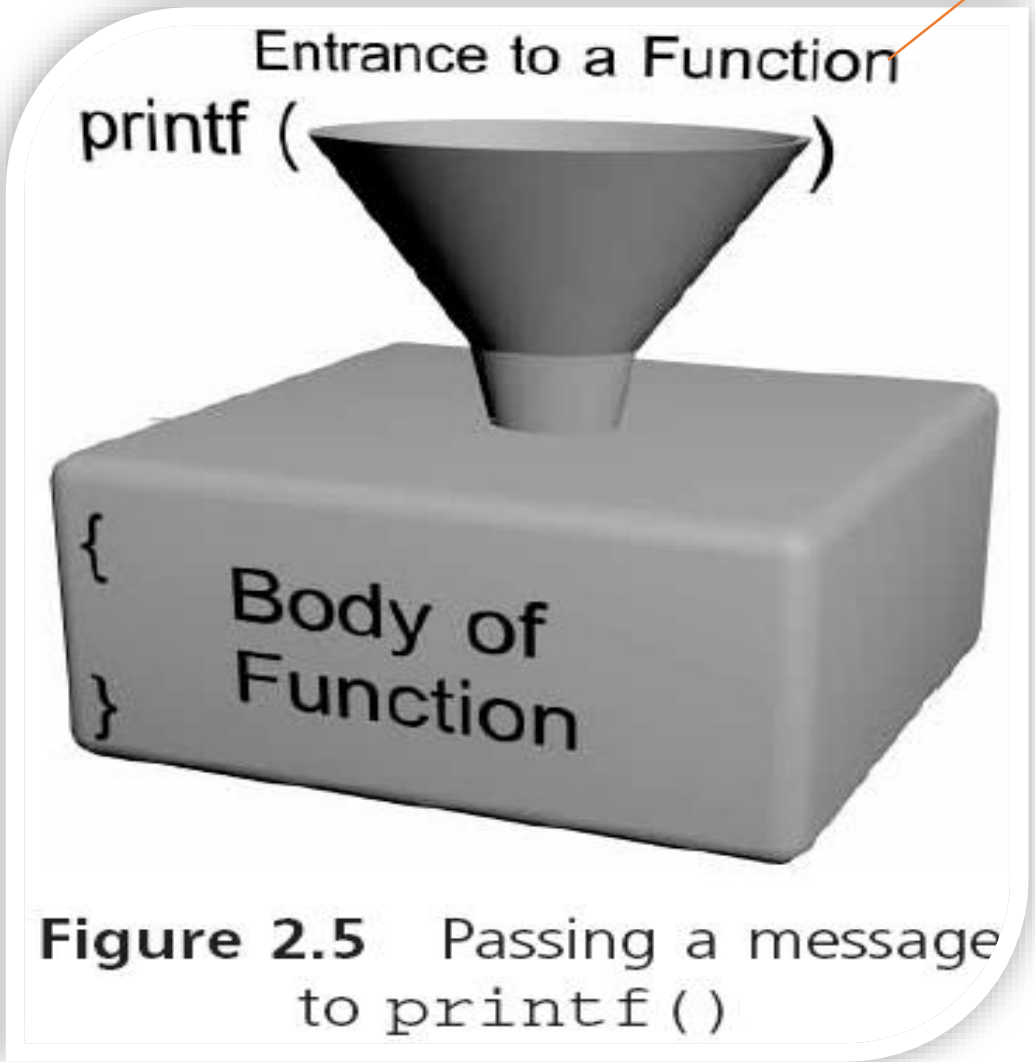

Figure 2.5 Passing a message to `printf()`

Function arguments

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➢ The *printf()* Function

```
1.  /* Program2.2.cpp
2.  Description: display hello there world.
3.  Programmer: Chengtian Ouyang.
4.  Date: 2015,5,1*/
5.  #include <stdio.h>
6.  int main()
7.  {
8.          printf("Hello there world\n");
9.          return 0;
10. }
```

Comment

Preprocessor command

Header file

Invoking or calling the printf() function

2.2 Programming Style

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- **Indentation** (缩进排版)
  - Indentation is another sign of good programming practice, especially if the same indentation is used for similar groups of statements.
  - Using **Format use Astyle** for Indentation in codeblocks
  - Using **Alt +F8** for Indentation in vs.

2.2 Programming Style:

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➢Comments (注释)

—Comments help clarify what a program does, what a group of statements is meant to accomplish, etc.

—single-line comment **//单行注释**

- **//this is a comment**

—multi-line comment **/*多行注释 */**

- **/* this is a comment */**

Reference

- BOOK
- Some part of this PPT given by Prof 区 **Chengtian Ouyang)**
- with special thank
- https://www.codingunit.com/c-tutorial hello-world