

1 Errors and debugging – Part 2

Name: _____ Class: _____ Date: _____

Vocabulary 词汇

Write each word three times. 把每个单词抄写三遍。

English	中文	Write it 3 times (English)
bug	错误	_____
Debugging	调试	_____

Recall

In Part A you saw that programs are tested. Testing finds **bugs**:

- A "bug" is a mistake in a program.
- Even careful programmers make them.
- Finding and fixing bugs is a normal part of coding.

Each idea has a worked example before the Practice.

New ideas

■ 1 What a bug is

A **bug** 错误 is an error in a program that makes it behave wrongly. There are a few kinds:

Syntax error	Logic error	Runtime error
breaks the language's rules → won't run	runs, but gives the wrong result	crashes while running (e.g. ÷ by zero)

- a **syntax error** (breaking the language’s grammar, so it won’t run),
- a **logic error** (it runs but gives the wrong answer),
- a **runtime error** (it crashes while running).

■ 2 Debugging

Debugging 调试 is the process of finding and fixing bugs –by testing, reading the code, and checking values step by step.

■ 3 Trace tables

A **trace table** follows a program’s variables line by line, so you can see exactly where it goes wrong.

count	total	output
1	5	
2	12	
3	20	20

■ 4 Testing

Good testing tries many inputs –ordinary ones, edge cases (like 0 or an empty list), and wrong inputs –to catch bugs before users do.

Watch out: a program with **no error message** can still be **wrong** –a logic error runs fine but produces the wrong answer. That is why you must check the output, not just that it runs.

Practice

Try these in order. The methods are all above.

2.1 State what a bug is. [1]

2.2 State the difference between a syntax error and a logic error. [2]

2.3 State what ”debugging” means. [1]

2.4 State what a trace table is used for. [2]

2.5 Explain why a program that runs without any error might still be wrong. [2]
