

Exercise walk-through

Introduction to Algorithms, Programming, and Compilers ■ 1.1

eXercise

You must be able to

- describe an **algorithm** 算法 as a finite set of clear, ordered steps
- explain how **source code** 源代码 is written in Java
- describe how a **compiler** 编译器 translates Java into a runnable form
- distinguish a **syntax error** 语法错误 from a **logic error** 逻辑错误

Method — Algorithm and program

An **algorithm** is a finite, ordered set of clear steps that solves a problem. A **program** carries out an algorithm; its **source code** is written in a language such as Java and its statements run in a defined order.

Method — Compiler

A **compiler** translates Java source code into a form the computer can run.

Method — Two kinds of error

- **Syntax error** — breaks the language's rules (e.g. a missing semicolon); the program will not compile.
- **Logic error** — compiles and runs, but gives the **wrong result**.

Practice 2.1 ■ 1 mark

Define an algorithm.

Solution 2.1

Worked steps

a finite set of clear, ordered steps that solves a problem **B1**.

Practice 2.2 ■ 1 mark

State what a compiler does.

Solution 2.2

Worked steps

it translates Java source code into a form the computer can run **B1**.

Practice 2.3 ■ 2 marks

State the difference between a syntax error and a logic error.

Solution 2.3

Method: Two kinds of error

Worked steps

a syntax error breaks the language's rules so it will not compile; a logic error compiles and runs but gives the wrong result **B1** **B1**.

Exam-style 3.1 ■ 1 mark

A compiler translates

- A** machine code into Java
- B** Java source code into a runnable form
- C** nothing at all
- D** data into bits

Solution 3.1

Method: Compiler

- A machine code into Java
- B Java source code into a runnable form** 
- C nothing at all
- D data into bits

Worked steps

B.

Exam-style 3.2 ■ 1 mark

A program that runs but produces the wrong answer has a

A syntax error

B logic error

C compiler error

D case with no error

Solution 3.2

Method: Two kinds of error

A syntax error

B logic error 

C compiler error

D case with no error

Worked steps

B.

Exam-style 3.3 ■ 1 mark

A Java statement is missing its semicolon.

- (a) Name the type of error.
- (b) State whether the program will compile.
- (c) State the order in which a program's statements run.

Solution 3.3

Method: Two kinds of error

Worked steps

(a) a syntax error **B1**. (b) no **B1**. (c) in the order written (top to bottom) **B1**.