

Exercise walk-through

Algorithms with Selection and Repetition ■ 2.1

eXercise

You must be able to

- express an algorithm using **sequencing** 顺序, **selection** 选择, and **repetition** 重复
- explain how selection lets an algorithm make choices
- explain how repetition lets an algorithm repeat steps

Method — Three building blocks

Every algorithm is built from:

- **Sequencing** — running steps in order.
- **Selection** — choosing between paths (an if statement).
- **Repetition** — repeating steps (a loop).

Method — Example

“For each score, if it is above 50, print it” uses **repetition** (for each) plus **selection** (if above 50).

Practice 2.1 ■ 2 marks

Name the three building blocks of an algorithm.

Solution 2.1

Method: Three building blocks

Worked steps

sequencing, selection, repetition **B1** **B1** *for any two; for all three.*

Practice 2.2 ■ 1 mark

State what selection lets an algorithm do.

Solution 2.2

Method: Three building blocks

Worked steps

it lets the algorithm choose between different paths based on a condition **B1**.

Practice 2.3 ■ 1 mark

State what repetition lets an algorithm do.

Solution 2.3

Method: Three building blocks

Worked steps

it lets the algorithm repeat a block of steps **B1**.

Exam-style 3.1 ■ 1 mark

Choosing between paths in an algorithm is

A sequencing

B selection

C repetition

D casting

Solution 3.1

Method: Three building blocks

A sequencing

B selection



C repetition

D casting

Worked steps

B.

Exam-style 3.2 ■ 1 mark

Repeating a block of steps is

A sequencing

B selection

C repetition

D overloading

Solution 3.2

Method: Three building blocks

A sequencing

B selection

C repetition 

D overloading

Worked steps

C.

Exam-style 3.3 ■ 1 mark

An algorithm checks each of 10 scores and prints those above 50.

- (a) Name the building block that repeats the check.
- (b) Name the building block that decides “above 50”.
- (c) Name the building block that runs steps in order.

Solution 3.3

Method: Three building blocks

Worked steps

(a) repetition **B1**. (b) selection **B1**. (c) sequencing **B1**.