

Exercise walk-through

Using Programs with Data ■ 2.4

eXercise

You must be able to

- explain how a program **processes** 处理 data to produce new information
- use **iteration** 迭代 to examine each element of a data set
- apply a **filter** 筛选 to select records that meet a condition
- describe how **cleaning** data improves reliability

Method — Iteration and filtering

A program uses **iteration** to look at each element of a data set in turn. A **filter** keeps only the records that meet a condition (e.g. “age < 20”).

Method — Combining and cleaning

A program can **combine or transform** data from more than one source to answer a question, and **cleaning** the data first (removing errors) makes the results more reliable.

Practice 2.1 ■ 1 mark

State what a filter does to a data set.

Solution 2.1

Method: Iteration and filtering

Worked steps

it selects the subset of records that meet a given condition **B1**.

Practice 2.2 ■ 1 mark

State why a program uses iteration on a data set.

Solution 2.2

Method: Iteration and filtering

Worked steps

to examine or process each element in turn **B1**.

Practice 2.3 ■ 1 mark

State how cleaning data improves the results.

Solution 2.3

Method: Combining and cleaning

Worked steps

it removes errors and inconsistencies, so the results are more reliable **B1**.

Exam-style 3.1 ■ 1 mark

A filter applied to a data set

- A** deletes all the data
- B** selects the records that meet a condition
- C** sorts the data randomly
- D** adds random noise

Solution 3.1

Method: Iteration and filtering

- A deletes all the data
- B selects the records that meet a condition 
- C sorts the data randomly
- D adds random noise

Worked steps

B.

Exam-style 3.2 ■ 1 mark

Looping through every record in a list is an example of

- A** a filter
- B** iteration
- C** a variable
- D** metadata

Solution 3.2

A a filter

B iteration 

C a variable

D metadata

Worked steps

B.

Exam-style 3.3 ■ 1 mark

A program reads 10 000 survey records and keeps only those from teenagers.

- (a) Name the operation used to keep only teenagers.
- (b) Name the process of looping over all the records.
- (c) State one reason to clean the data first.

Solution 3.3

Method: Iteration and filtering

Worked steps

(a) a filter **B1**. (b) iteration **B1**. (c) to remove errors or duplicates for reliable results **B1**.