

# Exercise walk-through

## Impact of Program Design ■ 3.2

eXercise

## You must be able to

- explain that design choices affect how **reliable** 可靠 and **maintainable** 可维护 a program is
- describe how a program can have unintended consequences for users
- understand the value of testing with a wide range of inputs

## Method — Why design matters

Good design makes a program more **reliable** (it works correctly) and **maintainable** (it is easy to change). Poor design can cause **unintended consequences** for its users.

## Method — Testing widely

Testing with a **wide range of inputs**, including edge cases, reveals defects that a few simple tests would miss.

## Practice 2.1 ■ 1 mark

State one quality that good program design improves.

## Solution 2.1

Method: Why design matters

### Worked steps

reliability or maintainability (any one) **B1**.

## Practice 2.2 ■ 1 mark

State why you should test with a wide range of inputs.

## Solution 2.2

Method: Testing widely

### Worked steps

to find defects that only appear on some inputs **B1**.

## Practice 2.3 ■ 1 mark

State what it means for a program to be “maintainable”.

## Solution 2.3

Method: Why design matters

### Worked steps

it is easy to understand and change **B1**.

## Exam-style 3.1 ■ 1 mark

Good program design improves a program's

- A** speed only
- B** reliability and maintainability
- C** file size
- D** colour

## Solution 3.1

Method: Why design matters

- A speed only
- B reliability and maintainability
- C file size
- D colour



### Worked steps

B.

## Exam-style 3.2 ■ 1 mark

Testing with a wide range of inputs helps to

**A** slow the program down

**B** find defects

**C** add bias

**D** compress data

## Solution 3.2

Method: Testing widely

**A** slow the program down

**B** find defects 

**C** add bias

**D** compress data

### Worked steps

B.

## Exam-style 3.3 ■ 1 mark

A poorly designed program is hard to change and often breaks.

- (a) State one quality it lacks.
- (b) State one way to catch its bugs.
- (c) State one risk that poor design poses to users.

## Solution 3.3

Method: Why design matters

### Worked steps

- (a) reliability (or maintainability) **B1**. (b) test it with many varied inputs **B1**.
- (c) unintended consequences **B1**.