

Exercise walk-through

9.1

Computational solution skills

International Baccalaureate · IB Diploma · Computer Science · SL

You must be able to

- turn a vague requirement into a testable **success criterion**
- choose **normal data** , **boundary data** and **invalid data** for a test
- write a **test plan** row that points to a criterion
- explain a code extract: what it does in the product and why it was chosen
- judge a criterion as met, partly met or not met, using evidence

1

The method

Method — Key knowledge: from problem to evidence

Weak criterion	Strong criterion
It is easy to use.	A result is entered in under 30 s, in at most three clicks.
It stores players.	It stores name, year group and rating, kept after closing.
It is secure.	Only the coach, with a password, can change results.

A strong criterion names **who**, **what**, and **how it is checked**.

Exercises 2.1·2.2

2.1 Rewrite “The program should be fast” as a testable success criterion. [2]

2.2 A criterion says “The program accepts a quantity from 1 to 20.” Give one normal, one boundary and one invalid test value. [3]

Exercises 2.1-2.2

2.1 Rewrite “The program should be fast” as a testable success criterion. [2]

2.1

- names a measurable time, e.g. “within 2 seconds”
- names the action and size, e.g. “pairings for up to 40 players appear after pressing *Pair*”

2.2 A criterion says “The program accepts a quantity from 1 to 20.” Give one normal, one boundary and one invalid test value. [3]

2.2

- normal: any value from 2 to 19, e.g. **10**
- boundary: **1** or **20**
- invalid: **0**, **21**, or a non-number such as “five”

Exercises 2.3-3.1

2.3 A write-up lists “variables, loops, if statements, functions” as its techniques. Explain why this earns little. [2]

3.1 For “age 11 to 18 accepted”, which value is boundary data? [1]

☐

A 15

B 18

C 19

D “eleven”

Exercises 2.3-3.1

2.3 A write-up lists “variables, loops, if statements, functions” as its techniques. Explain why this earns little. [2]

2.3

- it names features without saying how or why they are used in this product
- it should show a code extract of a key technique and explain what it does and why it was chosen

3.1 For “age 11 to 18 accepted”, which value is boundary data? [1]

- ☐ **A** 15
- B** 18
- C** 19
- D** “eleven”

3.1 B

- 18 is the top edge of the allowed range

Exercises 3.2-3.3

3.2 When should the test plan be written?

[1]

☐

A after the program is finished

B before coding, from the success criteria

C only if a test fails

D after the evaluation

3.3 Which is an acceptable way to use code from an AI tool?

[1]

☐

A paste it in without comment

B acknowledge the tool, show what was changed, and explain the code

C rename the variables so it looks original

D use it only in the test plan

Exercises 3.2-3.3

3.2 When should the test plan be written?

[1]

- ☐ **A** after the program is finished
B before coding, from the success criteria
C only if a test fails
D after the evaluation

3.2 B

- it fixes what must be shown to work before the product exists

3.3 Which is an acceptable way to use code from an AI tool?

[1]

- ☐ **A** paste it in without comment
B acknowledge the tool, show what was changed, and explain the code
C rename the variables so it looks original
D use it only in the test plan

3.3 B

- acknowledging, adapting and explaining is academic integrity

Exercise 3.4 (a)

3.4 A school canteen wants an app where students pre-order lunch by 10:00, choosing one main dish and up to two sides.

(a) Write **two** testable success criteria for the app.

[2]

Exercise 3.4 (a)

3.4 A school canteen wants an app where students pre-order lunch by 10:00, choosing one main dish and up to two sides.

(a) Write **two** testable success criteria for the app. [2]

(a) Any two testable criteria, e.g.:

- an order with one main and up to two sides is saved, and the student sees a confirmation
- orders after 10:00 are refused with a message; the kitchen list prints in under 5 s

Exercise 3.4 (b)

3.4 A school canteen wants an app where students pre-order lunch by 10:00, choosing one main dish and up to two sides.

(b) For the rule “up to two sides”, write a test plan with one normal, one boundary and one invalid test, each with its expected result. [3]

Exercise 3.4 (b)

3.4 A school canteen wants an app where students pre-order lunch by 10:00, choosing one main dish and up to two sides.

(b) For the rule “up to two sides”, write a test plan with one normal, one boundary and one invalid test, each with its expected result. [3]

(b)

- normal: one side, **accepted**
- boundary: two sides, **accepted**
- invalid: three sides, **rejected with a message**

Exercise 3.4 (c)

3.4 A school canteen wants an app where students pre-order lunch by 10:00, choosing one main dish and up to two sides.

(c) The app sorts the day's orders by collection time before printing them for the kitchen. Explain why this technique was chosen. [2]

Exercise 3.4 (c)

3.4 A school canteen wants an app where students pre-order lunch by 10:00, choosing one main dish and up to two sides.

(c) The app sorts the day's orders by collection time before printing them for the kitchen. Explain why this technique was chosen. [2]

(c)

- the kitchen prepares meals in the order they are collected
- so sorting by collection time gives a list that can be worked through from the top

Exercise 3.4 (d)

3.4 A school canteen wants an app where students pre-order lunch by 10:00, choosing one main dish and up to two sides.

(d) In testing, an order placed at 10:00 exactly was rejected, although the requirement says “by 10:00”. Evaluate this result and state what the student should do. [3]

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(d) In testing, an order placed at 10:00 exactly was rejected, although the requirement says “by 10:00”. Evaluate this result and state what the student should do. [3]

(d)

- the criterion is **not met**: “by 10:00” includes 10:00
- the likely cause is a boundary error, < used where <= was needed
- fix the comparison, re-run the test and record both results as evidence