

Exercise walk-through

Random Values ■ 3.15

eXercise

You must be able to

- explain how a program generates a **random** 随机 value within a range
- use a random number to introduce **variability** 变化
- apply random values to model **unpredictable** 不可预测 events
- explain why repeated runs can produce different outputs

Method — Random values

A program can generate a **random** value within a specified range to introduce **variability** into its behaviour.

Method — Modelling chance

Random values model **unpredictable** events such as a dice roll or coin flip.

Method — Different outputs

Because the value is random, running the same program again can produce a **different output** each time — `random(1, 6)` gives some whole number from 1 to 6.

Practice 2.1 ■ 1 mark

State one use of random values in a program.

Solution 2.1

Method: Random values

Worked steps

any one of: model chance, add variability, shuffle, simulate an event **B1**.

Practice 2.2 ■ 1 mark

State why a program using randomness can give different results each run.

Solution 2.2

Method: Different outputs

Worked steps

the random value can differ each time the program runs **B1**.

Practice 2.3 ■ 1 mark

State one everyday event that can be modelled with random values.

Solution 2.3

Worked steps

a dice roll, a coin flip, or shuffling cards (any one) **B1**.

Exam-style 3.1 ■ 1 mark

A program generates a random number to add

A a syntax error

B variability

C a comment

D a byte

Solution 3.1

Method: Different outputs

A a syntax error

B variability 

C a comment

D a byte

Worked steps

B.

Exam-style 3.2 ■ 1 mark

Rolling a die in a program is modelled with a

A fixed value

B random value

C string

D loop

Solution 3.2

A fixed value

B random value 

C string

D loop

Worked steps

B.

Exam-style 3.3 ■ 1 mark

A dice game uses `random(1, 6)`.

- (a) State the possible outputs.
- (b) State whether two runs must give the same result.
- (c) State one reason to use randomness.

Solution 3.3

Method: Different outputs

Worked steps

(a) a whole number from 1 to 6 **B1**. (b) no **B1**. (c) to model an unpredictable event (or add variety) **B1**.