

Exercise walk-through

Class Variables and Methods ■ 3.7

eXercise

You must be able to

- declare a **static variable** 静态变量 shared by every object of a class
- understand that a static variable belongs to the **class**, not any single object
- write a **static method** that does not act on an individual object's state

Method — Static (class) variables

A **static variable** is shared by **every** object of the class — there is only **one** copy, belonging to the class itself. It is useful for a shared count or a constant.

Method — Static methods

A **static method** belongs to the class and does **not** act on an individual object's state (so it uses no instance variables directly).

Practice 2.1 ■ 1 mark

State what a static variable is shared by.

Solution 2.1

Method: Static (class) variables

Worked steps

every object of the class **B1**.

Practice 2.2 ■ 1 mark

State whether a static variable belongs to the class or to each object.

Solution 2.2

Worked steps

the class **B1**.

Practice 2.3 ■ 1 mark

State one use of a static variable.

Solution 2.3

Method: Static (class) variables

Worked steps

a shared count, or a class constant (any one) **B1**.

Exam-style 3.1 ■ 1 mark

A static variable is

- A** unique to each object
- B** shared by all objects of the class
- C** a local variable
- D** a parameter

Solution 3.1

Method: Static (class) variables

- A unique to each object
- B shared by all objects of the class 
- C a local variable
- D a parameter

Worked steps

B.

Exam-style 3.2 ■ 1 mark

A static method

- A** acts on one object's state
- B** does not act on an individual object
- C** requires `new`
- D** is a constructor

Solution 3.2

Method: Static methods

- A acts on one object's state
- B does not act on an individual object 
- C requires new
- D is a constructor

Worked steps

B.

Exam-style 3.3 ■ 1 mark

A class counts how many objects have been created, using a shared count.

- (a) Name the kind of variable used for the count.
- (b) State what it belongs to.
- (c) State whether each object has its own copy of it.

Solution 3.3

Method: Static (class) variables

Worked steps

(a) a static variable **B1**. (b) the class **B1**. (c) no — there is one shared copy **B1**.