

Exercise walk-through

Implementing Array Algorithms ■ 4.5

eXercise

You must be able to

- find the **sum**, **average**, minimum, or maximum of an array
- **count** how many elements meet a condition
- determine whether an array **contains** a matching value

Method — Sum and average

```
k+ktint+w nsum+w o+=w l+m+mi0p;  
kfor+w p(k+ktint+w nx+w p:+w nap)+w nsum+w o+=w nxp;  
k+ktdouble+w navg+w o+=w p(k+ktdoublep)+w nsum+w o/+w nap.n+nalengthp;
```

Method — Minimum, maximum, and counting

Track a “best so far” variable for the min or max; use an `if` inside the loop to **count** elements that meet a condition, or to detect whether a value is present.

Practice 2.1 ■ 1 mark

Describe how to find the sum of an array.

Solution 2.1

Worked steps

start a total at 0 and add each element as you loop through the array **B1**.

Practice 2.2 ■ 2 marks

For `int[] a = {2, 4, 6};`, find the sum and the average.

Solution 2.2

Worked steps

$\text{sum} = 2 + 4 + 6 = 12$; $\text{average} = 12/3 = 4$ **M1** **A1**.

Practice 2.3 ■ 1 mark

State how to count the elements greater than 5.

Solution 2.3

Method: Minimum, maximum, and counting

Worked steps

loop over the array and increment a counter inside an if ($x > 5$) **B1**.

Exam-style 3.1 ■ 1 mark

To find the maximum of an array, you

- A** add all the elements
- B** track the largest value seen so far
- C** sort then divide
- D** count the elements

Solution 3.1

- A** add all the elements
- B** track the largest value seen so far 
- C** sort then divide
- D** count the elements

Worked steps

B.

Exam-style 3.2 ■ 1 mark

The average of $\{4, 8, 12\}$ is

A 8

B 24

C 4

D 12

Solution 3.2

A 8



B 24

C 4

D 12

Worked steps

A.

Exam-style 3.3 ■ 1 mark

```
int[] a = {5, 10, 15, 20};
```

- (a) Find the sum.
- (b) Find the average.
- (c) Count the elements greater than 10.

Solution 3.3

Method: Minimum, maximum, and counting

Worked steps

(a) 50 **B1**. (b) 12.5 **B1**. (c) 2 (the values 15 and 20) **B1**.