Algorithms and data structures

Learn and practise | Free preview

A sample from this topic. The complete topic collection contains three different resources and worked solutions.

Read the explanation and worked example. Show your working; use a calculator only where asked.

What you will practise

• Use lists and tables to organise mathematical algorithms.

• Explain a method and check the reasonableness of a result.

Useful starting skills: Use the prerequisite operations and representations shown in the worked example.

A data structure stores related values, such as a list of measurements or a table of paired coordinates. Algorithms can loop through entries, update totals or search for values.

Choose clear indexing and initialise variables. Test empty inputs, repeated values and negative values where valid. Document what the output represents.

Worked example

Find the mean of list[3,7,8] using an algorithm.

Set total=0; add each entry to get 18.

Divide by list length 3.

Answer: 6

Try it yourself

Name: _____ Date: _____

1. Trace total=0, then add each value in[2,5,9].

2. A list has length 4 and uses indices 0–3. What is its last valid index?

Answers and explanations

Check the method as well as the final answer. An alternative correct method is also valid.

1. 16

Successive totals 2,7,16.

2. 3

Zero-based indexing starts at 0.

Curriculum reference: VC2M10A06

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