

8.2 Arrays

Name: _____ Class: _____ Date: _____

Total: 10 marks

Objective

Build the skills to answer exam questions on **arrays** 数组—declaring and using **one-dimensional (1D)** 一维 and **two-dimensional (2D)** 二维 arrays, and using a loop to fill or read them.

You must be able to:

- declare a 1D and a 2D array and use an **index** 索引 to read/write a value
- use a loop (and a nested loop) to process an array
- choose between a 1D and a 2D array for a problem

1 Worked examples

■ 1D and 2D arrays

index	1	2	3	4	5
scores	90	75	60	88	50

↑
scores[2] is 75

A 1D array is a list; each value is found by one index

			column		
			1	2	3
	1				
row	2				
	3				

← grid[2,3]

A 2D array is a table; each value is found by two indexes [row, column]

- 1D: DECLARE `scores` : ARRAY[1:5] OF INTEGER, then `scores[2] ← 75`.
- 2D: DECLARE `grid` : ARRAY[1:3, 1:3] OF INTEGER, then `grid[2, 3] ← 8`.

2 Practice

2.1 An array is declared `DECLARE temps : ARRAY[1:7] OF REAL`. State how many values it can hold. [1]

2.2 State one difference between a 1D and a 2D array. [2]

3 Exam-style questions

3.1 Which data structure best stores the marks of 30 students in **one** subject? [1]

- **A** a single variable
- **B** a 1D array
- **C** a 2D array
- **D** a constant

3.2 An array `names` holds 5 names in elements 1 to 5.

(a) Write pseudocode to output every name using a loop. [3]

(b) State which type of array (1D or 2D) you would use to store the marks of 30 students in **5** subjects, and why. [2]

4 Go further

You are now ready for the real exam questions on this subtopic. Open the **8.2 Arrays** past-paper sheet in the Library, or try these in **Practice mode**:

- 0478/21 N25 —Q11 (arrays)
- 0478/22 N25 —Q2 (1D array processing)

Solutions

2.1 7.

2.2 a 1D array is a single list using one index; a 2D array is a table using two indexes [row, column].

3.1 B. One subject = a single list = a 1D array.

3.2 (a) `FOR i ← 1 TO 5; OUTPUT names[i]; NEXT i.`

(b) a 2D array; because each student needs 5 marks, so two indexes [student, subject] are required.