MODULE M PROGRAMMING · M18

One-dimensional arrays

Original practice questions · 22 marks · ~25 minutes · OCR J277 spec 2.2.3 (with 2.1.2 trace tables)

Name _____ Date _____

Instructions. Answer all questions in the spaces provided. The marks for each part are shown in brackets [ ]. The total for this worksheet is **22 marks**. Code is written in OCR Exam Reference Language, where arrays are 0-indexed (the first element has index 0). All data on this sheet is made up.

1

Total: 3 marks

(a) Tick (✓) the **two** statements that are true for an array in OCR Exam Reference Language. **[2]**

Statement	Tick (✓)
Every element in an array must be the same data type.	
The first element of an array has the index 1.	
An array can store a number in one element and a string in another.	
Once an array has been declared, it cannot change size while the program runs.	
`array codes[4]` creates the elements `codes[1]` to `codes[4]`.	

(b) A program needs to store 50 temperature readings. Give **one** reason why the programmer should store them in an array rather than in 50 separate variables. **[1]**

2

Total: 2 marks

A bank of parcel lockers has five locker units. This line of code stores the number of parcels waiting in each unit:

```
array parcels = [12, 0, 7, 16, 9]
```

(a) State the value of `parcels[3]`. **[1]**

(b) The unit that has no parcels waiting now has 15 parcels. Write **one** line of code to change the value `0` in the array to `15`. **[1]**

3 **Total: 2 marks**

A small hotel has five rooms. A programmer writes these two lines of code:

```
01 array guests[5]
02 guests[5] = "Ola Mensah"
```

(a) Line 02 causes an error when the program runs. Explain why. **[2]**

4 **Total: 5 marks**

A warehouse has four delivery robots. The array `levels` stores the battery level of each robot. Any robot with a level below 50 is given a 20-point top-up.

```
01 array levels = [40, 85, 15, 60]
02 low = 0
03 for i = 0 to 3
04     if levels[i] < 50 then
05         levels[i] = levels[i] + 20
06         low = low + 1
07     endif
08 next i
09 print(low)
```

(a) Complete the trace table for the program. You may not need to use all the rows. **[3]**

i	low	Output

(b) Complete the table to show the contents of the array `levels` after the program has finished. **[2]**

Index	0	1	2	3
levels				

5 **Total: 4 marks**

A small cinema records the number of tickets sold on each of the 7 days of a week.

(a) Write a program that: **[4]**

- declares an array called `tickets` that has 7 elements
- uses a loop to ask the user to enter the number of tickets sold on each day, storing each value in the next element of `tickets`.

You must use either:

- OCR Exam Reference Language, or
- a high-level programming language that you have studied.

6 **Total: 6 marks**

A museum has six galleries, numbered 0 to 5. The array `visitors` stores the number of visitors in each gallery so far today. It has already been declared and filled:

```
array visitors = [120, 85, 230, 0, 64, 97]
```

(a) Write a program that: **[6]**

- asks the user to enter a gallery number from 0 to 5 and stores it
- adds 1 to the number of visitors stored for that gallery
- then uses a loop to output the number of visitors for every gallery.

You do not need to write the line that declares `visitors`. You do not need to validate the input.
You must use either:

- OCR Exam Reference Language, or
- a high-level programming language that you have studied.

Total for this worksheet: 22 marks