

9. A software developer is creating a program for a dog grooming company that has branches in Dundee, Edinburgh, Glasgow and Stirling. The following data is stored about each dog:
- dog ID
  - name of the dog
  - branch the dog attends
  - number of visits to the branch.

One feature of the program is to offer a discount to customers that have visited the Dundee or the Stirling branch more than four times.

The data shown below is stored in four parallel 1D arrays to test this feature.

dogID	dogName	branch	noOfVisits
G123	Rover	Glasgow	7
A872	Roman	Stirling	2
D321	Keeva	Dundee	6
G876	Bailey	Edinburgh	6
A423	Jack	Stirling	5
D872	Ozzy	Dundee	2

The code below was created to display the dogID for those customers that are to be offered a discount.

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Line 1  PROCEDURE customerSearch (ARRAY OF STRING petNo,
      ARRAY OF STRING city, ARRAY OF INTEGER visits)
Line 2  FOR i FROM 0 TO length(petNo)-1 DO
Line 3      IF city[i]= "Stirling" OR
      (city[i]= "Dundee" AND visits[i] > 4) THEN
Line 4          SEND petNo[i] TO DISPLAY
Line 5      END IF
Line 6  END FOR
Line 7  END PROCEDURE
...
Line 20 DECLARE dogID INITIALLY ["G123", "A872", "D321",
      "G876", "A423", "D872"]
Line 21 DECLARE dogName INITIALLY ["Rover", "Roman", "Keeva",
      "Bailey", "Jack", "Ozzy"]
Line 22 DECLARE branch INITIALLY ["Glasgow", "Stirling",
      "Dundee", "Edinburgh", "Stirling", "Dundee"]
Line 23 DECLARE noOfVisits INITIALLY [7, 2, 6, 6, 5, 2]
Line 24 customerSearch(dogID, branch, noOfVisits)

```



9. (continued)

- (a) During testing it is found that, due to an issue with Line 3, this code is not fit for purpose.

- (i) Using the test data shown, state the output.

2

- (ii) Re-write Line 3 of the code to make this code fit for purpose.

1

- (b) Formal and actual parameters are used in this code.

Identify one formal parameter and its associated actual parameter.

2

Formal parameter \_\_\_\_\_

Actual parameter \_\_\_\_\_

- (c) Describe the operation of Line 24 during the execution of this program.

`customerSearch(dogID, branch, noOfVisits)`

2

- (d) The program makes use of local variables.

- (i) Identify a local variable in the code.

1

- (ii) Describe the scope of this local variable.

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\* X 8 1 6 7 6 0 1 0 9 \*

9. (d) (continued)

- (iii) Explain why using local variables increases the maintainability of program code.

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- (e) The area manager wants to know how many dogs have made more than five visits to a particular branch.

Using a programming language of your choice, the arrays `branch` and `noOfVisits`, write the code to ask the user for the branch name and to display how many dogs have made more than five visits to this branch.

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