

10. Lewis uses a smart watch to track the distance he walks each day for a week. His target is to walk 5 kilometres or more each day.

The program will find the highest the number of consecutive days Lewis meets this target.

For example, if the data was 5.2, 4.2, 4.0, 4.8, 5.8, 5.2, 6.4

The expected output should be 3.

The following code has been developed to find the highest number of consecutive days Lewis has met his target but there is an error.

...

```
Line 09  FUNCTION consecutiveDays (ARRAY OF REAL values)
          RETURNS INTEGER
Line 10      DECLARE counter INITIALLY 0
Line 11      DECLARE longestStreak INITIALLY - 1
Line 12      FOR index FROM 0 TO LENGTH(values) - 1 DO
Line 13          SET counter TO 0
Line 14          IF values[index] >= 5.0 THEN
Line 15              SET counter TO counter + 1
Line 16          ELSE
Line 17              IF counter > longestStreak THEN
Line 18                  SET longestStreak TO counter
Line 19              END IF
Line 20              SET counter TO 0
Line 21          END IF
Line 22      END FOR
Line 23      IF counter > longestStreak THEN
Line 24          SET longestStreak TO counter
Line 25      END IF
Line 26      RETURN longestStreak
Line 27  END FUNCTION
...
Line 46  SET distances TO [5.2, 4.2, 4.0, 4.8, 5.8, 5.2, 6.4]
Line 47  SET daysMet TO consecutiveDays(distances)
...
```



10. (continued)

MARKS DO NOT WRITE IN THIS MARGIN

- (a) Complete the trace table for the first two iterations of the loop.

The trace table should indicate the line number where a variable changes value and the new value of that variable.

3

Line number	counter	index	longestStreak
10	0		
11			-1
12		0	
13	0		
15			
12			
13			
18			
20			

- (b) State the line number of the code that should be removed to correct the algorithm.

1

- (c) Name and describe a debugging technique that could be used during execution of the code.

2

- (d) Explain why the scope of the variable `counter` is local.

1



10. (continued)

- (e) Describe how modular programming increases the efficiency and maintainability of the code.

2

Efficiency _____

Maintainability _____

[END OF SECTION 1]

