MODULE M PROGRAMMING · M16

String handling: length, substring, upper and lower case

Original practice questions · 22 marks · ~25 minutes · Cambridge 0478 syllabus 8.1.4(e), 7.7, 7.8, 7.9

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**. Write all algorithms and statements in pseudocode. On this sheet, the first character of a string is in position 1. `SUBSTRING(S, Start, Length)` returns `Length` characters of S, beginning at position `Start`. All data on this sheet is made up.

1

Total: 4 marks

A tourist map program has carried out this statement:

```
Place ← "Copper Valley"
```

(a) Complete the table to show the value returned by each expression. **[4]**

Expression	Value returned
`LENGTH(Place)`	
`SUBSTRING(Place, 8, 3)`	
`UCASE(SUBSTRING(Place, 1, 3))`	
`LCASE(Place)`	

2

Total: 3 marks

The STRING variable `Product` has already been given a value by a stock control program.

(a) Write a pseudocode statement to store the number of characters in `Product` in the variable `Size`. **[1]**

(b) Write a pseudocode statement to store the **last** character of `Product` in the variable `LastChar`. **[2]**
Your statement must work for a string of any length.

3 **Total: 6 marks**

A word-puzzle program counts how many times the letter t appears in a word.

```
01 DECLARE Word : STRING
02 DECLARE Letter : STRING
03 DECLARE Count : INTEGER
04 DECLARE Index : INTEGER
05 Word ← "Trust"
06 Count ← 0
07 FOR Index ← 1 TO LENGTH(Word)
08     Letter ← LCASE(SUBSTRING(Word, Index, 1))
09     IF Letter = "t"
10       THEN
11         Count ← Count + 1
12     ENDIF
13 NEXT Index
14 OUTPUT "Number found: ", Count
```

(a) Complete the trace table for the algorithm. **[4]**

Index	Letter	Count	OUTPUT

(b) Explain why `LCASE` is used on line 08. **[2]**

4 **Total: 3 marks**

A holiday park checks booking references. A reference is accepted only if it is exactly 8 characters long **and** its first two characters are BK, typed in upper case or lower case.

The algorithm contains **three** errors.

```
01 DECLARE Ref : STRING
02 DECLARE Prefix : CHAR
03 OUTPUT "Enter the booking reference"
04 INPUT Ref
05 Prefix ← LCASE(SUBSTRING(Ref, 1, 2))
06 IF LENGTH(Ref) <> 8 AND Prefix = "BK"
07   THEN
08     OUTPUT "Reference accepted"
09   ELSE
10     OUTPUT "Reference rejected"
11 ENDIF
```

(a) Identify the line number of each error and suggest a correction. **[3]**

Error 1 Line number ..... Correction

Error 2 Line number ..... Correction

Error 3 Line number ..... Correction

5 **Total: 6 marks**

A garden centre prints a short code on each plant label. For example, for a plant called Lavender the output could be: `Label code: LAV 8`

(a) Write an algorithm using pseudocode to: **[6]**

- input the name of a plant, repeating the input until the name has at least 3 characters
- convert the plant name to upper case
- output, with a suitable message, the first three characters of the upper case name and the number of characters in the name.

You do not need to declare any variables.

Total for this worksheet: 22 marks