MODULE O ROBUST PROGRAMS · O3

Validation vs verification

Original practice questions · 20 marks · ~25 minutes · Cambridge 0478 syllabus 7.5(b), 7.5(a), 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 **20 marks**. Write all algorithms in pseudocode. All data on this sheet is made up.

1

Total: 4 marks

(a) Tick (✓) **one** box in each row to show whether the statement describes **validation** or **verification**. **[4]**

Statement	Validation (✓)	Verification (✓)
The data shown on the screen is compared, by eye, with the paper form it was copied from.		
A delivery date is only accepted if it has been entered in the form DD/MM/YYYY.		
A check that the data entered is the same as the data that was meant to be entered.		
A quantity is rejected if it is not a whole number.		

2

Total: 4 marks

A clerk at a builders' merchant types the quantities from paper orders into a stock program. The program has a range check that accepts any quantity from 1 to 500 inclusive. One order is for 105 bags of sand, but the clerk types 150.

(a) Explain why the range check does not detect this mistake. **[2]**

(b) The program is changed so that the clerk must carry out a **visual check** on each quantity. Describe how the visual check would find this mistake. **[2]**

3

Total: 4 marks

A water company uses this algorithm when a customer service adviser enters a customer's account number.

```
01 DECLARE Entry1 : STRING
02 DECLARE Entry2 : STRING
03 DECLARE Attempts : INTEGER
04 Attempts ← 0
05 REPEAT
06     INPUT Entry1
07     INPUT Entry2
08     Attempts ← Attempts + 1
09     IF Entry1 <> Entry2
10       THEN
11         OUTPUT "Entries do not match, start again"
12     ENDIF
13 UNTIL Entry1 = Entry2
14 OUTPUT "Account number ", Entry1, " accepted after ", Attempts, " attempts"
```

(a) Complete the trace table for the algorithm using the input data: **[4]**

`58204, 58240, 58204, 52804, 58204, 58204`

The first row has been done for you. You may not need to use all the rows.

Entry1	Entry2	Attempts	OUTPUT
		0	

4 **Total: 5 marks**

A hotel receptionist copies each guest's car registration from a booking form into the car park program. The program uses a **visual check** to verify each registration.

(a) Write an algorithm using pseudocode to: **[5]**

- ask the receptionist to enter the car registration, and input it
- output the registration that was entered, and ask whether it matches the booking form (Y or N)
- input the reply
- repeat all of the steps above until the reply is Y
- then output a message to say the registration has been saved.

You do not need to declare any variables.

5 **Total: 3 marks**

A smart door lock lets its owner set a new PIN. The algorithm should use a **double entry check**: the PIN is entered twice, and it is only saved when the two entries are the same. The algorithm contains **three** errors.

```
01 REPEAT
02     OUTPUT "Enter the new PIN"
03     INPUT NewPin
04     OUTPUT "Enter the new PIN again"
05     ConfirmPin ← NewPin
06     IF NewPin = ConfirmPin
07       THEN
08         OUTPUT "The two entries are different, please try again"
09     ENDIF
10 UNTIL NewPin <> ConfirmPin
11 OUTPUT "New PIN saved"
```

(a) Identify the line numbers of the **three** errors and write the correct pseudocode for each line. **[3]**

Line number	Correct pseudocode

Total for this worksheet: 20 marks