# Worksheet 3 Validation and verification

**Task 1**

1. Data on pupils registering at a secondary school needs to be entered. The data is as follows:

Registration number (6 numeric digits)

Surname

First name

Date of Birth

Gender

Phone number

Name and describe the validation checks that could be carried out on each of these fields.

**Task 2**

A product code is 7 digits long. The rightmost digit is a check digit, calculated as follows:

* assign weights of 2, 3, 4, 5, 6, 7 to each of the digits of the number, starting from the rightmost digit
* multiply each digit by its weight
* add the resulting numbers together
* divide by 10 using integer division
* Subtract the remainder from 10
* If the remainder is zero, the check digit is zero
* Otherwise, subtract the remainder from 10 and the result is the check digit

(a) Calculate the check digit for the number 355416. What is the final product code?

(b) Which of the following product codes is valid? Show your working.

5673142 5763140

* + To check whether the product code is valid, perform the calculation again, assigning a weight of 1 to the check digit.
  + If the result is divisible by 10, the check digit is correct.

**Task 3**

(a) In December 2005, a Japanese securities trader made a $1 billion typing error, when he mistakenly sold 600,000 shares of stock at 1 yen each instead of selling one share for 600,000 yen.

What validation check could have been applied to prevent this type of error?

(b) A Norwegian woman mistyped her account number on an internet banking system. Instead of typing her 11-digit account number, she accidentally typed an extra digit, for a total of 12 numbers. The system discarded the extra digit, and transferred $100,000 to the (incorrect) account.

What validation check could have been applied to prevent this type of error?

**Task 4**

A user is required to enter a number between 1 and 5 when choosing from a menu of 5 options. If they enter three invalid numbers, the program displays the message “Program ending”. Otherwise, it displays the message “Continue”.

Trace through the following pseudocode algorithm. Use the trace tables below and and record the output if the user enters the numbers:

(a) 6, 0, 4

(b) 7, 8, 9

validChoice 🡨 False

count 🡨 0

OUTPUT “Enter choice (1-5)”

WHILE (validChoice = False AND (count < 3)

INPUT choice

count 🡨 count + 1

IF choice < 1 OR choice > 5 THEN

OUTPUT “Invalid choice”

ELSE

validChoice 🡨 True

ENDIF

ENDWHILE

IF validChoice = False THEN

OUTPUT “Program ending”

ELSE

OUTPUT “Continue”

ENDIF

|  |  |  |  |
| --- | --- | --- | --- |
| **validChoice** | **choice** | **count** | **OUTPUT** |
| False | - | 0 | Enter choice (1-5) |
|  |  |  |  |
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|  |  |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **validChoice** | **choice** | **count** | **OUTPUT** |
|  |  |  |  |
|  |  |  |  |
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|  |  |  |  |
|  |  |  |  |

**Task 5**

(a) Write a pseudocode algorithm to do the following:

1. Ask a user to enter a new password.
2. Ask the user to re-enter the password
3. If the two passwords match, the message “Please continue” is output.
4. If the two passwords do not match, the program outputs a message “Incorrect password – please re-enter a new password”,
5. Steps 1-4 are repeated until the user enters two identical passwords.

(b) Suggest **two** conditions for a new password that could be specified and validated.