The following pseudocode routines show some **validation** and **authentication** routines. A description of what the routine does is shown on the lower right of each box.

```
constant minPasswordLength ← 8
password ← ''

WHILE LEN(password) < minPasswordLength
      OUTPUT 'Type in a password at least ' + minPasswordLength + ' characters'
      password ← USERINPUT
      IF LEN(password) < minPasswordLength THEN
            OUTPUT 'Password too short'
      ELSE
            OUTPUT 'Password correct length'
            passwordCorrectLength ← True
      ENDIF
ENDWHILE
```

This code shows a routine to check that a password has a length of 8 characters. Notice how the length is in a constant so that it can be used in more than one place in the program. This code is an example of a **length check**.

```
username ← ''

WHILE username = ''
      username ← USERINPUT
      IF username = '' THEN
            OUTPUT 'Username empty – try again'
      ELSE
            OUTPUT 'Username entered'
      ENDIF
ENDWHILE
```

This code is a routine to check if a username has been entered correctly. This is an example of a **presence check**.

```
dayOfMonthValid ← False #flag to show correct day between 1 and 31 entered
dayOfMonth ← 0

WHILE NOT dayOfMonthValid
      dayOfMonth ← STRING_TO_INT(USERINPUT)
      IF dayOfMonth < 1 OR dayOfMonth > 31 THEN
            OUTPUT 'Enter a day of the month between 1 and 31'
      ELSE
            OUTPUT 'Valid date of month'
            dayOfMonthValid ← True
      ENDIF
ENDWHILE
```

This code checks that a number between 1 and 31 has been entered. It is an example of a **range check**. Notice how a **flag** variable is used to determine if the user has correctly entered the correct data.

```
username ← Sam
password ← 'cd4FjP@L'
detailsValid ← False #flag to show username and password entered correctly

WHILE NOT detailsValid
      enteredUsername ← USERINPUT
      enteredPassword ← USERINPUT
      IF enteredUsername ≠ username OR enteredPassword ≠ password THEN
            OUTPUT 'Username or password invalid'
      ELSE
            OUTPUT 'Correct username and password'
            detailsValid ← True
      ENDIF
ENDWHILE
```

This code checks that a username and password have both been correctly entered. It is a simple example of **authentication**.