CHAPTER 7
VALIDATION AND VERIFICATION

1. What is validation?

Validation is the automated checking by a program to ensure that only data that is reasonable is accepted. It does not check the accuracy of data. It also checks that data meets certain criteria. Eg: Type check, length check, check digit etc.

2. What are the types of validation?

There are many different types of validation checks including:

i. Range checks:- checks only numbers within a specified range. For eg; Examination mark is in between 0 and 100
ii. Length checks:- Length checks are used to check that input data contains a certain number of characters. Eg: An international telephone number can be no longer than 15 digits.
iii. Type checks: checks that the data entered is of a given data type.
iv. Character checks:- checks that when a string of characters is entered it does not contain any invalid characters or symbols
v. Format checks: Checks the data is in the right format. A National Insurance number is in the form LL 99 99 99 L where L is any letter and 9 is any number.
vi. Presence checks: to ensure that some data has been entered and the value has not been left blank, for example an email address must be given for an online transaction.
vii. Check digit: It is an extra digit added to a number which is calculated from other digits; the computer recalculates this digit after the number has been input.

3. What is verification?

Verification is checking that data has been accurately copied onto the computer or transferred from one part of a computer system to another. Verification methods include:

i. double entry
ii. screen/visual check (proof reading)
iii. parity check
iv. Checksum.

4. What is double entry

The double entry is input the data twice to the computer. The computer then checks the two data values (which should be the same) and, if they are different, the computer knows that one of the inputs is wrong. E.g. entering password twice during login.

5. What is visual check?

Visual checks is basically **proof reading**, the data that has been entered into the computer is visually checked by a human, either on screen or from a printout, to be sure that it matches the data source

Find the check digit using Modulo-11 method

Step1 Multiply all digit individually with its position value and all resulting products are added.

Step 2: Divide this total by 11 and find the remainder

Step 3: Subtract the remainder from 11: which is the check digit,

Q1.Find the check digit for 2530618:

  2 5 3 0 6 1 8   digits

   8 7 6 5 4 3 2

   2 5 3 0 6 1 8 ——

     8x2+7x5+6x3+5x0+4x6+3x1+2x8

     $16 + 35 + 18 + 0 + 24 + 3 + 16 = 112$

     112/11=remainder is 2

           11 - 2 = 9

           9 is the check digit

           Number with check digit 25306189

Q2. Find whether the given number is valid or not?

  Check digit for 25306189:

   2 5 3 0 6 1 8 9 digits

8 7 6 5 4 3 2 1

2 5 3 0 6 1 8 9

     multiply by weight

$16 + 35 + 18 + 0 + 24 + 3 + 16 + 9 = 121$

Remainder is 0

When the remainder is 0, we know the number with the check digit is valid!

Number with check digit 25306189

CHECK DIGIT USING MODULO-13

1. Add all the odd numbered digits together, excluding the check digit.
2. Add all the even numbered digits together and multiply the result by 3.
3. Add the results from 1 and 2 together and divide by 10.
4. Take the remainder, if it is zero use this value, otherwise subtract the remainder from 10 to find the check digit

Q1. Find check digit of ISBN number 9 7 8 0 3 4 0 9 8 3 8

$9 + 8 + 3 + 0 + 8 + 8 = 36$

$3(7 + 0 + 4 + 9 + 3 + 2) = 75$ 3

$(36 + 75) = 11$ 1

$=111/10=1$

1 is the remainder

$10 - 1 = 9$ the check digit.

Q2. Find the check digit of given number is valid or not

1 Add all the odd numbered digits together, including the check digit

2 Add all the even number of digits together and multiply the result by 3

3 Add the results from 1 and 2 together and divide by 10.

4 The number is correct if the remainder is zero.

Example:

9 7 8 0 3 4 0 9 8 3 8 2 9

1 $9 + 8 + 3 + 0 + 8 + 8 + 9 = 45$

2 $3(7 + 0 + 4 + 9 + 3 + 2) = 75$

3 $(45 + 75)/10 = 12$ remainder 0

4 Remainder is 0 therefore number is correct.