Check Digit.

Saturday, 7 August 2021 5:25 PM

Transmission
- Comp. to Comp. — Parity, ARQ, Checksum
- Human to Comp. — Check Digit.

Original Number

3529638

352638

3539738

3592638

Types of errors while entering data:
1. Digit skip
2. Change digit
3. Swap digit (Transposition)

✓ 1. Finding check digit

✓ 2. Checking check digit. (Validation).

- We will find check digit using "modulo 11" method.

Original Number: 4241508(n) ← check digit

Digits	4	2	4	1	5	0	8	?
	×	×	×	×	×	×	×	
Positions	1	2	3	4	5	6	7	8

4 + 4 + 12 + 4 + 25 + 0 + 56

⇒ 105

11) 105 (9
99
(6) ← Check digit.

42415086

Sideline

2) 15 (7 ← DIV()
14
(1) ← MOD()

- 15/2 = 7.5 Absolute Div.
- 15 DIV 2 = 7
  DIV (15,2) = 7
  Integer Quotient
- 15 MOD 2 = 1
  MOD (15,2) = 1
  Remainder.

- Remainders in "Modulo 11" will be from 0 — 10
  0 – 9 takes 1 space
  10 takes 2 spaces.
- Two spaces holding remainder can't be used as we have only one space position available for the check digit
- We use roman 10 (X) instead of denary 10.

Check digit validation (Checking an entered number):

Number entered = 324004 5(X) ← ignore the checkdigit and find your own.

Then check both; if they are same then entered number is correct otherwise incorrect.

3	2	4	0	0	4	5
×	×	×	×	×	×	×
1	2	3	4	5	6	7
=	=	=	=	=	=	=

3 + 4 + 12 + 0 + 0 + 24 + 35
= 78

11) 78 (7
77
(1) Check digit is 1

3240045X is entered incorrectly. (invalid)

Another method for the check digit validation

0 1 2 3 (4)

0	1	2	3
×	×	×	×
3	2	3	2
=	=	=	=
0	2	6	6

0 + 2 + 6 + 6 = 14

10) 14 (1
10
(4) — Same. Correctly entered. (Valid)

1. Multiply 1st and 3rd digit by 3
2. Multiply 2nd and 4th digit by 2
3. Sum four totals.
4. Divide the found sum by 10
5. Remainder is check digit.