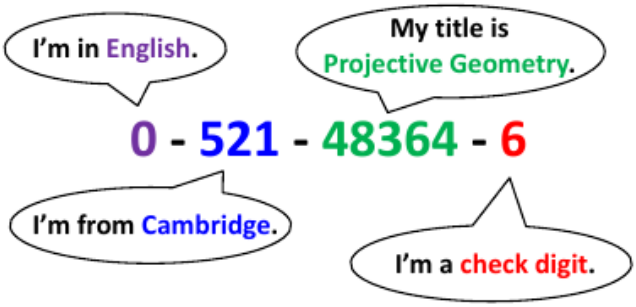
ISBN Numbers

ISBN (International Standard Book Number):

- A 10-digit or 13-digit number that identifies a book for purposes of commerce and supply chains
- The last digit of the ISBN is a check digit used to detect transcription errors.
- This last digit is sometimes an X (representing the number 10).

An ISBN has 4 parts:

- group/country identifier: 0 or 1 for English, 2 for French, 3 for German, 4 for Japanese, 8 for Indian
- publisher identifier
- title identifier
- check digit



10-Digit ISBN:
The sum of the digits multiplied by 1-10 respectively should add to a multiple of 11.
Last digit = **1**×1st digit + **2**×2nd digit + **3**×3rd digit + **4**×4th digit + **5**×5th digit + **6**×6th digit + **7**×7th digit + **8**×8th digit + **9**×9th digit **(mod 11)**

- ISBN: 3-540-56489-6

  Last Digit = 1×3 + 2×5 + 3×4 + 4×0 + 5×5 + 6×6 + 7×4 + 8×8 + 9×9 (mod 11)
  = 3 + 10 + 12 + 0 + 25 + 36 + 28 + 64 + 81 (mod 11)
  = 259 (mod 11)
  = 6

- ISBN: 1st nine digits are ___ ___ ___ ___ ___ ___ ___ ___ ___

  Last digit = 1 × _____ + 2 × _____ + 3 × _____ + 4 × _____ + 5 × _____

  + 6 × ___ + 7 × _____ + 8 × _____ + 9 × _____ (mod 11)

  = _____ + _____ + _____ + _____ + _____ +

  _____ + _____ + _____ + _____ mod 11

  = _____ mod 11 = _____

- ISBN: 1st nine digits are ___ ___ ___ ___ ___ ___ ___ ___ ___

  Last digit = 1 × _____ + 2 × _____ + 3 × _____ + 4 × _____ + 5 × _____
  + 6 × ___ + 7 × _____ + 8 × _____ + 9 × _____ (mod 11)
  = _____ + _____ + _____ + _____ + _____ +
  _____ + _____ + _____ + _____ mod 11
  = _____ mod 11 = _____

Question: How many 10-digit ISBNs are there?

_____

Books published since January 2007 are required to have 13-digit ISBNs.

For a 13-digit ISBN, the last digit is found as follows:

Let

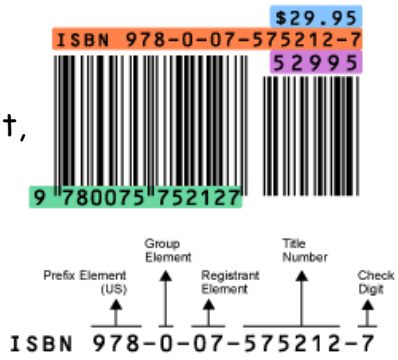
a = 1st digit + 3rd digit + 5th digit + 7th digit + 9th digit + 11th digit,

b = 2nd digit + 4th digit + 6th digit + 8th digit + 10th digit + 12th digit,

c = a + (3 × b), and

d = c mod 10.

Then last digit = 10 – d.



Let's try it:

1st 12 digits _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ ___

a = _____ + _____ + _____ + _____ + _____ + _____ = _____,

b = _____ + _____ + _____ + _____ + _____ + _____ = _____ ,

c = _____ + (3 × _____) = _____ , and

d= _____ mod 10 = _____.

Then last digit = 10 – _____ = _____.