ISBN-13 (Sumber Wikipedia.org)

The 2005 edition of the International ISBN Agency's official manual[20] covering some ISBNs issued from January 2007, describes how the 13-digit ISBN check digit is calculated.

The calculation of an ISBN-13 check digit begins with the first 12 digits of the thirteen-digit ISBN (thus excluding the check digit itself). Each digit, from left to right, is alternately multiplied by 1 or 3, then those products are summed modulo 10 to give a value ranging from 0 to 9. Subtracted from 10, that leaves a result from 1 to 10. A zero (0) replaces a ten (10), so, in all cases, a single check digit results.

For example, the ISBN-13 check digit of 978-0-306-40615-*?* is calculated as follows:

s = 9×1 + 7×3 + 8×1 + 0×3 + 3×1 + 0×3 + 6×1 + 4×3 + 0×1 + 6×3 + 1×1 + 5×3
  = 9 + 21 + 8 + 0 + 3 + 0 + 6 + 12 + 0 + 18 + 1 + 15
  = 93
93 / 10 = 9 remainder 3
10 – 3 = 7

Thus, the check digit is 7, and the complete sequence is ISBN 978-0-306-40615-7.

Formally, the ISBN-13 check digit calculation is:

$$x_{13} = (10 - (x_1 + 3x_2 + x_3 + 3x_4 + \cdots + x_{11} + 3x_{12}) \bmod 10) \bmod 10.$$

This check system — similar to the UPC check digit formula — does not catch all errors of adjacent digit transposition. Specifically, if the difference between two adjacent digits is 5, the check digit will not catch their transposition. For instance, the above example allows this situation with the 6 followed by a 1. The correct order contributes 3×6+1×1 = 19 to the sum; while, if the digits are transposed (1 followed by a 6), the contribution of those two digits will be 3×1+1×6 = 9. However, 19 and 9 are congruent modulo 10, and so produce the same, final result: both ISBNs will have a check digit of 7. The ISBN-10 formula uses the prime modulus 11 which avoids this blind spot, but requires more than the digits 0-9 to express the check digit.

Additionally, If you triple the sum of the 2nd, 4th, 6th, 8th, 10th, and 12th digits and then add them to the remaining digits (1st, 3rd, 5th, 7th, 9th, 11th, and 13th), the total will always be divisible by 10 (i.e., end in 0).

Errors in usage

Publishers and libraries have varied policies about the use of the ISBN check digit. Publishers sometimes fail to check the correspondence of a book title and its ISBN before publishing it; that failure causes book identification problems for libraries, booksellers, and readers.[21]

Most libraries and booksellers display the book record for an invalid ISBN issued by the publisher. The Library of Congress catalogue contains books published with invalid ISBNs, which it usually tags with the phrase "Cancelled ISBN".[22] However, book-ordering systems such as Amazon.com will not search for a book if an invalid ISBN is entered to its search engine.

Tugas 05 :

Tentukan angka yang hilang pada ISBN 13 berikut :

1. ISBN 13 : 978-979-756-628-?
2. ISBN 13 : 978-602-875-?07-9