

Converting a Number in Base Two to Base Ten

Horner's Algorithm:

Input: A number represented in base B . B can be any base, e.g., $B = 2$.

Output: The equivalent representation in base ten.

Method:

1. Start with: $T = 0$. Process the digits from left to right
2. Repeat:
 - 2a. Multiply T by B and add the next digit.
 - 2b. The new value of T is the value you computed in the step above.
 - 2c. When you have added the last digit, go to step 3.
3. Output T

Converting a Number in Base Ten to Another Base

Remainder Method:

Input: A number X represented in base ten, and a base B .

Output: The equivalent representation in base B .

Method:

1. Start with: $T = X$.
2. Repeat:
 - 2a. Divide T by B to get quotient Q and remainder R .
 - 2b. The value of R is the next higher-order digit. Write it.
 - 2c. The value of Q becomes the new value of T . If Q is zero, then STOP.