Hexadecimal Subtraction

Hexadecimal subtraction is similar to decimal subtraction but operates in the base 16 number system, which uses 16 different digits: 0–9 and A–F, where A = 10, B = 11, C = 12, D = 13, E = 14, and F = 15.

Rules of Hexadecimal Subtraction:

1. Subtract column by column from right to left.

2. If the digit in the minuend (the number you're subtracting from) is smaller than the digit in the subtrahend (the number being subtracted), borrow from the next left column. In hexadecimal, borrowing means adding 16 to the current column's digit.

Example:

Let's subtract two hexadecimal numbers: $9A3_{16}$ - $4F8_{16}$

Step-by-step process:

1. Subtract the rightmost column (units place):
   3 - 8
   Since 3 is smaller than 8, we need to borrow 1 from the next column. Borrowing 1 in hexadecimal adds 16 to the 3, making it 3 + 16 = 19. Now:
   19 - 8 = 11
   In hexadecimal, 11 is represented by B, so the result for this column is B.

2. Subtract the next column (tens place), accounting for the borrowing:
   After borrowing, the original A (which is 10 in decimal) is reduced by 1, making it 9. Now subtract:
   9 - F
   Since 9 is smaller than F (which is 15 in decimal), we need to borrow again. Borrowing 1 from the next column, 9 becomes 9 + 16 = 25 in decimal. Now:
   25 - 15 = 10
   In hexadecimal, 10 is represented by A.

3. Subtract the leftmost column (hundreds place), after borrowing:
   After borrowing, the original 9 was reduced by 1, resulting in 8. Now subtract:
   8 - 4 = 4

Final Result: $9A3_{16}$ - $4F8_{16}$ = $4AB_{16}$