

Assignment 4-1

The `hexmultiplication` function multiplies two hexadecimal numbers represented as arrays `n1` and `n2`. It stores the product in `finalproduct`. The program also handles conversions: `hextodec` converts hexadecimal characters to decimal values, `hexdigitoutput` converts hex to characters for output, and `hextodecimal` converts a hexadecimal string to its decimal representation.

The main function reads two hexadecimal strings as input, performs multiplication, prints the multiplication operation, the resulting product in hexadecimal form, and the product in decimal form. It continues this process until it encounters invalid inputs (such as no input or both inputs being '0').

Throughout the code, it handles various conditions, such as managing leading/trailing zeros, ensuring correct alignment in the output, and handling special cases where one of the input numbers is zero.

Assignment 4-2

The `hex_multiplication` function performs hexadecimal multiplication by simulating manual multiplication. It initializes `sep_sum`, an array to hold intermediate products of each digit pairing from the input hexadecimal numbers `result1` and `result2`. Using nested loops, it multiplies corresponding digits and stores the results in `sep_sum`, considering the carry for each digit multiplication. It arranges these products in the array according to their respective place values. Then, by iterating through columns and rows of `sep_sum`, it sums up these products while considering the carry, converts the accumulated sum back to a hexadecimal character, and places it in the `sum` array. This process continues for all digits, effectively mimicking the process of manual multiplication in hexadecimal, resulting in the accurate product of the input hexadecimal numbers. The function manages carry values and follows fundamental multiplication principles to obtain the final result.