3b. Write a C program to calculate the ‘n’th power of a given number ‘x’. Take both ‘n’ and ‘x’ as inputs from the user.

Description:

This program calculates the **n**th power of a given number **x**. The power of a number is defined as:

result = x^n

- The user inputs the base number **x** and the exponent **n**.
- The program calculates **x^n** using a loop (without using the pow() function).
- It displays the computed result.

Example:

2^3 = 2 * 2 * 2 = 8

Algorithm:

Step 1: Start

Step 2: Declare integer variables x, n, result, and i.

Step 3: Prompt the user to enter the base number (x) and the exponent (n).

Step 4: Read and store the values of x and n.

Step 5: Initialize result = 1.

Step 6: Use a loop to multiply result by x, n times:
- **For** i = 1 to n:
- Multiply result = result * x.

Step 7: Display the final result as x^n .

Step 8: Stop

Source Code:

```
#include <stdio.h>
int main() {
    int base, n, i, result = 1;

    // Taking inputs from the user
    printf("Enter the base: ");
    scanf("%d", &base);
    printf("Enter the exponent (n): ");
    scanf("%d", &n);

    // Calculating power manually
    for (i = 0; i < n; i++) {
        result = result * base;
    }

    // Displaying the result
    printf("%d raised to the power %d is: %d\n", base, n, result);

    return 0;
}
```

Sample Output:

```
Enter the base: 2
Enter the exponent: 8
2 raised to the power 24 is: 256

Enter the base: 3
Enter the exponent: 4
3 raised to the power 4 is: 81
```