Lab 5: Recursion

Fulfill the following requirements using the recursion technique:

1. Calculate the sum of $S = 1 + 2 + 3 + ... + n$.
2. Calculate the factorial $n! = 1 * 2 * 3 * ... * n$.
3. Calculate x^n.
4. Count the number of digits of a given integer.
5. Count the number of odd digits of a given integer.
6. Verify if every digit of an integer is even.
7. Count the number of common divisors of 2 given integers.
8. Calculate the Greatest common divisor and Least common multiple of 2 given integers.
9. Calculate the reverse value of a given integer.
10. Calculate the binary value of a given integer.
11. Calculate the i^{th} Fibonacci number.
    - $F_0 = 0, F_1 = 1$
    - $F_n = F_{n-1} + F_{n-2}, (n \geq 2)$
12. * Given 4 single distinguish characters. Print out all possible permutations.
    - Example: ABCD, ABDC, ACBD, ...

    Fulfill the following requirements on the Singly Linkedlist structure:

13. Create a Singly Linkedlist from a given array.
14. Find and remove the first node with a given value.