Problems on recursion

1. Write a recursive function to calculate the factorial of n.
2. Write a recursive function to calculate the sum of the first n positive integers.
3. Write a recursive function to calculate the sum of the following series upto its nth term:
   1 + 5 + 9 + 13 + …
4. Write a recursive function to calculate the sum of the following series upto its nth term:
   1 + 2 + 4 + 8 + …
5. Write a recursive function to calculate the nth Fibonacci number.
6. Write a recursive function to calculate ${}^{n}C_{r}$ (recursion: ${}^{n}C_{r} = {}^{n-1}C_{r} + {}^{n-1}C_{r-1}$)
7. Write a recursive function to calculate the sum of the digits of an input integer.
8. *Write a recursive function to reverse a given integer.
9. *Write a recursive function to find out if a given integer is palindrome or not.

For the following problems, first try to solve using array indexing. Then, try to solve using pointer arithmetic.

1. Write a recursive function to sum the elements of an array.
2. Write a recursive function to sum the elements at the even/odd indices of an array.
3. Write a recursive function to check if a given number exists in an array.
4. Write a recursive function to reverse an array.
5. Write a recursive function to calculate the length of a string.
6. Write a recursive function to compare two strings (similar to strcmp).
7. Write a recursive function to copy a string to another one.
8. Write a recursive function to concatenate a string with another one.
9. *Write a recursive function to find out if a substring exists in another string.
10. Write a recursive function to reverse a string.