

## Programming Exercises

1. Write a program to find sum and average of n numbers using malloc(), calloc(), realloc(), and free() in C.
2. Write a program to implement Stack using array data structure.
3. Write a program to check an expression for balanced brackets.
4. Write a program to convert an infix expression to postfix.
5. Write a program to evaluate postfix expression.
6. Write a program to implement Linear Queue using array data structure.
7. Write a program to implement Circular Queue using array data structure.
8. Write a program to implement Priority Queue using array data structure.
9. Write both recursive and iterative program to
  - a. find factorial of a number.
  - b. find sum of first N natural numbers.
  - c. find Fibonacci number.
  - d. find greatest common divisor.
10. Write a recursive program to solve Tower of Hanoi (TOH) problem and hence count the number of moves required.
11. Write a program to find factorial of a number using tail recursion.
12. Write a program to insert and delete a node after some given node in a singly linked list (SLL).
13. Write a program to insert and delete a node at a given position in a singly linked list (SLL).
14. Write a program to search an element in a singly linked list.
15. Write a program to implement doubly linked list (DLL).
16. Write a program to implement Stack using linked list.
17. Write a program to implement Queue using linked list.
18. Write a program to merge two sorted arrays into a larger sorted array.
19. Write programs to implement:
  - a. Bubble sort
  - b. Selection sort
  - c. Insertion sort
  - d. Shell sort
  - e. Merge sort
  - f. Quick sort
20. Write programs to implement linear search for both unsorted and sorted data.
21. Write a program to implement binary search.
22. Write programs to implement
  - a. Separate chaining
  - b. Linear probing
  - c. Quadratic probing
  - d. Double hashing