ANCC Shivalik 2023
Interesting Topics/Problems - 1

Introduction

Here we are proving some standard and interesting problems or topics that you can look into when you are bored. Few of them may or may not have any direct implication in CP, but are very interesting stuff.

Problem/topics list

1. Maximum sum sub array problem ([leetcode](#))
2. Merge sort algorithm
3. Find the total no of inversion in a given list of numbers
4. same as problem 2 but this time you will start with an empty list and you are given an element to be inserted into the list at the end, you need to answer the number of inversion in the current list after giving each given element to add.
5. What is a linked list?
6. Find the loop in the linked in O(n)
   1. Floyd's tortoise and hare
7. Fenwick Tree (cp-algo)
8. Catalan numbers
   1. Refer wikipedia, many different applications and proofs are given
   2. CP hand book page 210
9. A different and faster way to multiply
   1. Karatsuba algorithm (for numbers)
   2. Strassen algorithm (for matrices)
10. Fast Fourier Transform (FFT), watch the following very interesting [video](#)