

## Recurrence Relation Solving Method

**Recurrence Relation Meaning :** The procedure for finding the terms of a sequence in a **recursive manner** is called recurrence relation.

for example :

### 1. Binary Search Algorithm :

$$T(n) = T(n/2) + c$$

where  $T(n)$  is the time required for binary search in an array of size  $n$

### 2. Merge Sort Algorithm :

$$T(n) = 2T(n/2) + n$$

### 3. Strassen's Matrix Multiplication :

$$T(n) = 7T(n/2) + n^2$$

Now the problem is to evaluate the time complexity with the help of a given Recurrence Relation.

This can be done by 3 methods :

- Master's Theorem
- Substitution Method
- Recursive Tree Method