

Divide and Conquer

Divide and conquer is a **general** algorithm design technique

- Recursive in nature
- Analysis can be done using **recurrence equations**

Divide and Conquer

1. **Divide** the problem into sub-problems that are similar to the original but smaller in size
2. **Conquer** the sub-problems by solving them recursively. If they are small enough, just solve them in a straightforward manner.
3. **Combine** the solutions to create a solution to the original problem

Analysis of D&C Algorithms

D&C algorithms result into following general recurrence relation:

$$T(n) = a T(n/b) + f(n)$$

The diagram illustrates the recurrence relation $T(n) = a T(n/b) + f(n)$ with three arrows pointing from descriptive text to its components:

- An arrow from "No. of subproblems" points to the coefficient a .
- An arrow from "Subproblem size" points to the term $T(n/b)$.
- An arrow from "Effort for dividing and combining" points to the term $f(n)$.