Module 4: Overview

Overview

In this module, we will study recurrence relations that are useful in the analysis of running times of divide-and-conquer algorithms. Very often, the running time of a divide-and-conquer algorithm satisfies certain recurrence relations. We are interested in finding tight asymptotic notations of the running time by solving the recurrence relations. Unfortunately, there is no universal solution method for recurrence relations. However, we will study the master method that can be used to solve many (not all) recurrence relations. We will also study other methods such as the substitution method and the recursive tree method.

In order to succeed in this module, you need to have a solid understanding of asymptotic notations.

Learning Objectives

By the end of this module, you will be able to:

1. Deriving the recurrence relations for running times of divide and conquer algorithms
2. Learn methods to derive asymptotic notations of running times from recurrence relations

Readings

Read the following:

- Section 4.0
- Section 4.5
- Section 4.3
- Section 4.4
- Section 4.1
- Section 4.2