Principles Of Computer Science

Introduction

- What is Computer Science?

- Study of computing systems.

- Focus: Software and its applications.
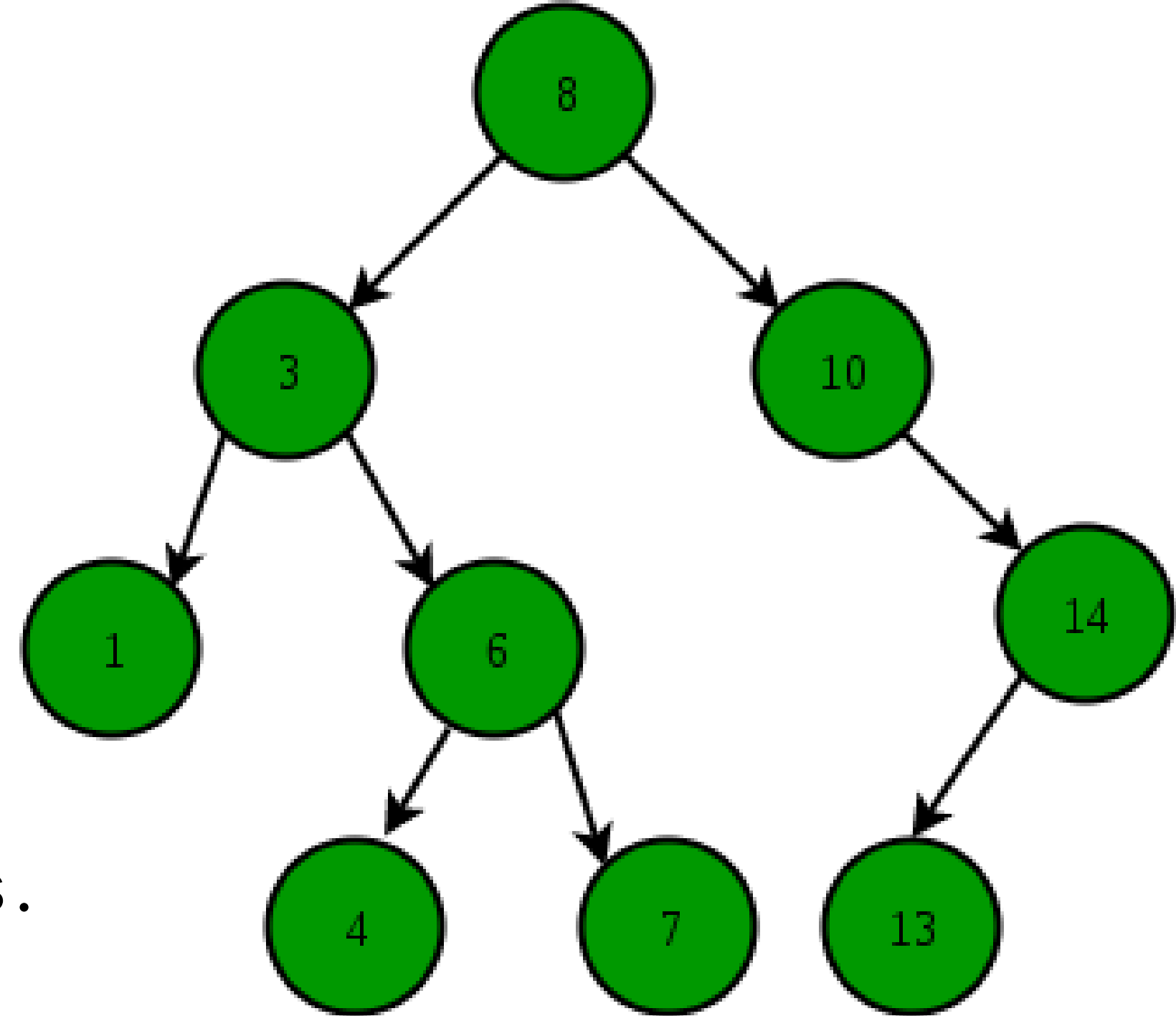
Algorithms

Definition

Step-by-step solutions to problems.

Types

Brute Force, Recursive, Binary Search.

Data Structures

Definition

Frameworks for data organization.

Use Cases

Applied in various fields beyond computing.

Programming Models

Overview

Procedural, Object-Oriented, Functional Programming.

Examples

- Procedural: C
- Object-Oriented: Java
- Functional: Haskell

Computational Theory

Focus Areas

- Automata Theory: Abstract machines.

- Complexity Theory: Modeling real-world systems.

System Architecture

Components

CPU, memory, I/O devices.

Operating Systems

Interface between software and hardware.

Emerging Technologies

AI and ML

- AI: Human-like tasks.
- ML: Predictions from data.

Applications

Autonomous vehicles, NLP.

Conclusion

Summary

Foundations like algorithms, data structures, and programming enable technology evolution.

Emerging Focus

AI and ML shaping the future.