

18.1 Introduction

The programs we’ve discussed so far are generally structured as methods that call one another in a hierarchical manner. For some problems, it’s useful to have a method *call itself*—this is known as a **recursive method**. Such a method can call itself either *directly* or *indirectly through another method*. Recursion is an important topic discussed at length in upper-level computer-science courses. Here, we consider recursion conceptually, then present several examples of recursive methods. [Figure 18.1](#) summarizes the book’s recursion examples and exercises.

Chapter	Recursion examples and exercises in this book
18	Factorial Method (Figs. 18.3 and 18.4)
	Fibonacci Method (Fig. 18.5)
	Towers of Hanoi (Fig. 18.11)
	Fractals (Fig. 18.20)
	What Does This Code Do? (Exercise 18.7 , Exercise 18.12 and Exercise 18.13)
	Find the Error in the Following Code (Exercise 18.8)
	Raising an Integer to an Integer Power (Exercise 18.9)
	Visualizing Recursion (Exercise 18.10)
	Greatest Common Divisor (Exercise 18.11)

	Determine Whether a String Is a Palindrome (Exercise 18.14)
	Eight Queens (Exercise 18.15)
	Print an Array (Exercise 18.16)
	Print an Array Backward (Exercise 18.17)
	Minimum Value in an Array (Exercise 18.18)
	Star Fractal (Exercise 18.19)
	Maze Traversal Using Recursive Backtracking (Exercise 18.20)
	Generating Mazes Randomly (Exercise 18.21)
	Mazes of Any Size (Exercise 18.22)
	Time to Calculate a Fibonacci Number (Exercise 18.23)
	Koch Curve (Exercise 18.24)
	Koch Snowflake (Exercise 18.25)
	Recursive File and Directory Manipulation (Exercise 18.26)
19	Merge Sort (Fig. 19.6) Linear Search (Exercise 19.8) Binary Search (Exercise 19.9) Quicksort (Exercise 19.10)
21	Binary-Tree Insert (Fig. 21.15) Preorder Traversal of a Binary Tree (Fig. 21.15) Inorder Traversal of a Binary Tree (Fig. 21.15) Postorder Traversal of a Binary Tree (Fig. 21.15) Print a Linked List Backward (Exercise 21.20) Search a Linked List (Exercise 21.21)

Fig. 18.1

Summary of the recursion examples and exercises in this text.