

# *Part 1*

## *Deterministic search algorithms*

**W**elcome to the first part of this book, where we'll embark on an exploration of deterministic graph search algorithms. This part consists of four chapters.

In chapter 1, you'll learn the fundamental concepts of search and optimization and understand their real-world significance. You'll discover how to define optimization problems, differentiate between well-structured and ill-structured problems, gain insight into the challenges of search algorithms, and understand the search dilemma.

Chapter 2 dives deeper into the classification of optimization problems. You'll learn how to categorize search and optimization algorithms based on different criteria. Additionally, you'll learn about heuristics, metaheuristics, and heuristic search strategies, with a sneak peek at nature-inspired algorithms.

In chapter 3, you'll explore graph search techniques, uncover graph traversal methods, and discover how to use blind search algorithms to find the shortest path between two nodes in a graph, all while solving practical routing problems.

In chapter 4, you'll delve into the concept of informed search. You'll learn how to solve the minimum spanning tree problem and find the shortest path using informed search algorithms, all while gaining practical problem-solving skills for real-world routing problems.

When you're finished with this part of the book, you'll have a solid grasp of the fundamentals of optimization, deterministic graph search algorithms, and practical problem-solving skills that are applicable to real-world scenarios, setting the stage for the diverse optimization algorithms explored in the following parts of this book.