

Part 3

Evolutionary computing algorithms

As we continue our journey into the world of optimization algorithms, this part will introduce you to the fascinating realm of genetic algorithms, a prime example of population-based metaheuristic algorithms. Within the two chapters of this part, you'll delve into the heart of evolutionary computation and unlock the potential of genetic algorithms as versatile tools for solving a wide range of optimization problems.

In chapter 7, you'll learn about population-based optimization algorithms and, more specifically, genetic algorithms. You'll discover the inner workings of evolutionary computation and gain a comprehensive understanding of the various components that make up genetic algorithms. We'll take a hands-on approach by implementing genetic algorithms in Python, allowing you to apply this powerful technique to practical problem-solving.

Chapter 8 will take you further into the world of genetic algorithms, exploring variants that enhance their adaptability to different problem types. You'll delve into Gray-coded genetic algorithms, explore real-valued genetic algorithms and their genetic operators, and understand permutation-based genetic algorithms and their applications. Additionally, you'll discover the concept of multi-objective optimization and learn how to fine-tune genetic algorithms to strike a balance between exploration and exploitation. Through practical examples, you'll see how genetic algorithms can efficiently solve both continuous and discrete optimization problems.