Hands-on Nonlinear Programming in Python

From Beginning to Giving Up

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2022-09-24

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Preface

1 Introduction

Part I

Unconstrained Nonlinear Programming

2 Unimodal Function and Search Methods

In this chapter, we look at unimodal functions and existing search methods developed for them.

2.1 Unimodal Function

A function f is unimodal if there exists only one maximum (minimum) point for maximization (minimization) problem. This means that the function increases in value up to a certain point, then decreases in value after reaching its maximum point. With unimodal functions, any extreme you find is guaranteed to be the global extreme. Perhaps the concept of unimodality is better grasped through an example. Consider the function $f(x)$ defined as

$$f(x) = (x + 2)^2$$

Figure 2.1 shows its plot defined on range [-10, 10].

Figure 2.2 shows a multimodal function.

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2.2 Equal Interval Search

2.3 Golden Section Search

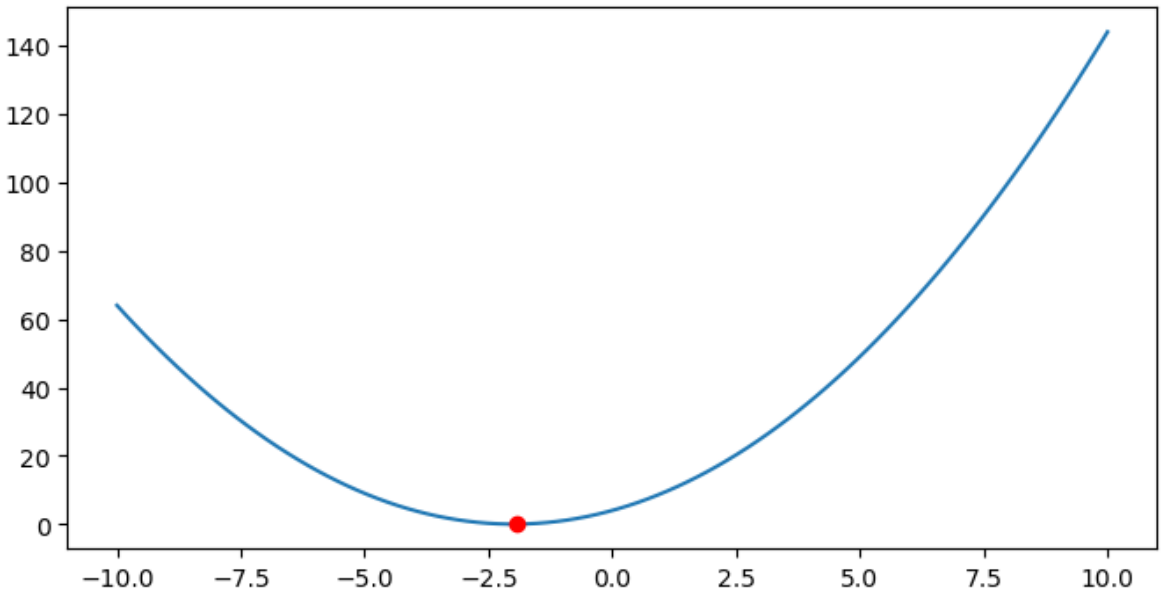

Figure 2.1: An unimodal function

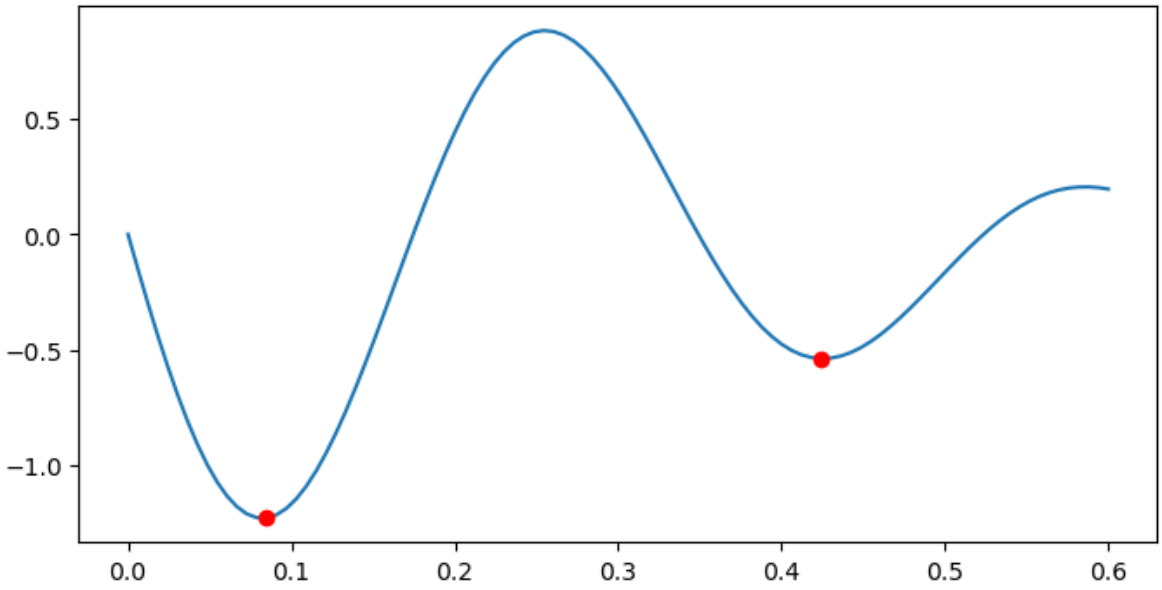

Figure 2.2: An multimodal function

Part II

Constrained Nonlinear Programming

3 Special NLP Forms

4 Summary

In summary, this book has no content whatsoever.

References