# bayes-theorem-book

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The triangle featured on the cover page is known as the Penrose Triangle, also referred to as the impossible triangle. It is an optical illusion that depicts a three-dimensional figure in the form of a triangular loop, which, despite its appearance, cannot be constructed in a physical three-dimensional space. It was created by a Swedish artist Oscar Reutersvärd in the 1930s and was later brought to prominence by mathematician Roger Penrose in the 1950s. Although the Penrose Triangle cannot be realized as a physical object, it represents an intriguing example of how visual perception can be deceived to see an ostensibly impossible form. It has emerged as an iconic figure in the realm of optical illusions and is frequently employed to demonstrate ideas related to paradoxes and the visual perception in the fields of art and design.

Essential Search Algorithms: Navigating the Digital Maze
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# Preface

Ever wonder how Google finds your perfect search result in milliseconds? Or how your GPS maps the fastest route to your destination? It's all thanks to the clever search algorithms invented by great software engineers who needed to solve some complex search problems.

Search algorithms are everywhere! From finding your friend's profile on Facebook to suggesting the best route on a map, these algorithms are constantly sifting through mountains of data, searching for what you're looking for. Search is at the core of all these real-world technology problems.

This book is your guide to essential search methods used across different fields. I've carefully curated these algorithms from a vast collection, selecting those that form the building blocks. Understanding and applying these algorithms will provide you with the necessary baseline to explore more complex ones. Plus, you might even be able to create your own algorithm tailored to the problem you're solving. Each section explains the ideas clearly and includes Python code you can use in your projects. All the code is free and available on my GitHub page under the MIT license.

By the end, you'll have the skills to explore both simple and complex decision-making. Whether it's managing supply chains or designing smart robots, these essential search methods will guide you through tough challenges and help you discover solutions you didn't know were there.

So, join me on a journey to understand how search works. Let's get started!

Muthukrishnan
Bangalore, India
2023

*For my parents, Amrita and Atharva*

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# Preface

This is a Quarto book.

To learn more about Quarto books visit https://quarto.org/docs/books.

# 1. Introduction

This is a book created from markdown and executable code.

See Knuth (1984) for additional discussion of literate programming.

# Part I.

# Introduction to Bayesian Thinking

# 2. Understanding Probability

# 3. Bayes' Theorem Fundamentals

# 4. Setting Up Python Environment

# Part II.

# Mathematical Foundations

# 5. Probability Theory Essentials

# 6. Statistical Concepts

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# Part IX.

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# 27. Performance Optimization

# 28. Modern Bayesian Libraries

# 29. Summary

In summary, this book has no content whatsoever.

# References

Knuth, Donald E. 1984. “Literate Programming.” *Comput. J.* 27 (2): 97–111. https://doi.org/10.1093/comjnl/27.2.97.