

Proof-Based Math Readings

Session: Algorithms

2026 Summer

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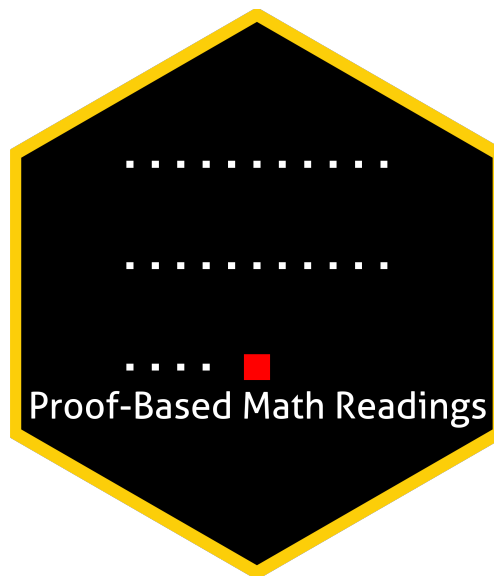
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0 Motivation

- *Proof-Based Math Readings* is a free and independent online reading group where we study mathematics required in economics master's/PhD programs using an intuitive approach.
- This session of the reading group is on *Algorithms*.

1 Prerequisites

- CGPA: 3.00/4.00. Supplementary Python and one of the Algorithms resources below.
- Please use the  [Application Form](#) to join our reading group; you will receive a response within a week.






2 Format

- This session takes 12 weeks. We do not have face-to-face/online meetings due to the size of the group.
- We discuss the topics and exercises at  [Proof-Based Math Readings \[Discord\]](#).
- Members are expected to read the chapters, and watch the chapter videos from the book's playlist.

3 Resources

3.1 Main Book and Main Book's Playlist

Introduction to Algorithms - T. Cormen, C. Leiserson, R. Rivest, C. Stein (4th Edition, 2022) is our main book for this session because it is well-written and well-structured.






-  [Introduction to Algorithms - T. Cormen, C. Leiserson, R. Rivest, C. Stein \(4th Edition, 2022\)](#)
-  [Introduction to Algorithms - T. Cormen, C. Leiserson, R. Rivest, C. Stein \(4th Edition, 2022, Playlist\)](#)
-  [Introduction to Algorithms - T. Cormen, C. Leiserson, R. Rivest, C. Stein \(4th Edition, 2022, Errata\)](#)
-  [Introduction to Algorithms - T. Cormen, C. Leiserson, R. Rivest, C. Stein \(4th Edition, 2022, Selected Solutions\)](#)
-  [Introduction to Algorithms - T. Cormen, C. Leiserson, R. Rivest, C. Stein \(3rd Edition, 2009, Solutions by M. Bodnar, A. Lohr\)](#)

3.2 Supplementary

3.2.1 Python

-  [Introduction to CS and Programming using Python - Ana Bell \(2022\)](#)

3.2.2 Algorithms

-  [Grokking Algorithms - Aditya Bhargava \(2nd Edition, 2024\)](#) → Easier to read
-  [Grokking Algorithms - Aditya Bhargava \(2nd Edition, 2024, Errata\)](#)
-  [Data Structures and Algorithms in Python - M. T. Goodrich, R. Tamassia, M. H. Goldwasser \(2013\)](#)
-  [Problem Solving with Algorithms and Data Structures using Python - B. Miller, D. Ranum, R. Yasinovskyy \(3rd Edition, 2023\)](#)
-  [Problem Solving with Algorithms and Data Structures using Python - B. Miller, D. Ranum, R. Yasinovskyy \(3rd Edition, 2023, Playlist by Gerry Jenkins\)](#)

3.2.3 Proof Techniques

-  [Book of Proof - Richard Hammack \(3.3 Edition, 2022\)](#)
-  [Book of Proof - Richard Hammack \(3.3 Edition, 2022, Playlist by Jeremy Teitelbaum\)](#)
-  [Book of Proof - Richard Hammack \(3.3 Edition, 2022, Playlist by Michael Penn\)](#)

4 Reading Schedule

- **CLRS** is the abbreviation of **Introduction to Algorithms - T. Cormen, C. Leiserson, R. Rivest, C. Stein (4th Edition, 2022)**.

 CLRS	Week 01 
Appendix A: Summations Appendix B: Sets, Etc. Appendix C: Counting and Probability Appendix D: Matrices	
 CLRS	Week 02-03 
Chapter 1: The Role of Algorithms in Computing Chapter 2: Getting Started Chapter 3: Characterizing Running Times	
 CLRS	Week 04-05 
Chapter 4: Divide-and-Conquer Chapter 5: Probabilistic Analysis and Randomized Algorithms	
 CLRS	Week 06-07 
Chapter 6: Heapsort Chapter 7: Quicksort Chapter 8: Sorting in Linear Time Chapter 9: Medians and Order Statistics	
 CLRS	Week 08-09-10 
Chapter 10: Elementary Data Structures Chapter 11: Hash Tables Chapter 12: Binary Search Trees Chapter 13: Red-Black Trees	
 CLRS	Week 11-12 
Chapter 14: Dynamic Programming Chapter 15: Greedy Algorithms	