

Proof-Based Math Readings

Session: Algorithms

2026 Summer

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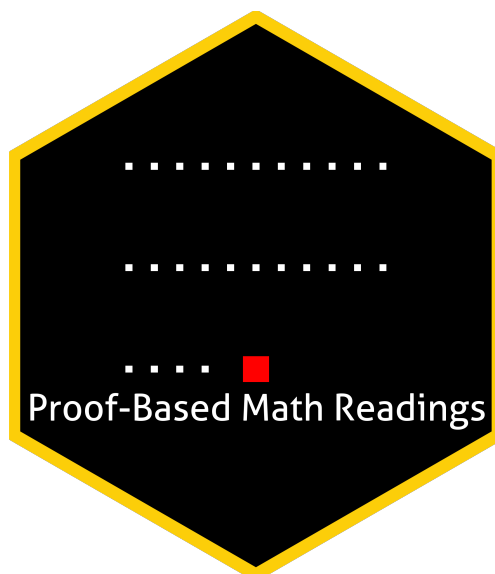
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0 Motivation

- *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 Algorithms resources below are the prerequisites for this session.
- Please use the  [Application Form](#) to join our reading group.
- Applicants are informed about their application results within a week via email.





2 Format

- This session takes 12 weeks.
- We discuss the topics/exercises that we struggle with at  [Proof-Based Math Readings \[Discord\]](#).
- We do not have face-to-face/online meetings due to the size of the group.
- 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 \(4th Edition, 2022, Selected Solutions\)](#)

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)
-  [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 - Bradkey Miller, David Ranum, Roman Yasinovskyy \(2023\)](#)
-  [Problem Solving with Algorithms and Data Structures using Python - Bradkey Miller, David Ranum, Roman Yasinovskyy \(2023, Playlist\)](#)

3.2.3 Proof

-  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	