

Reading Group Syllabus

January 2, 2020

Gabriel Chen

Reading Group Summary

This reading group intends to read the book *Computability and Complexity* by Neil D. Jones. You can find the book here: <http://hjemmesider.diku.dk/~neil/comp2book2007/book-whole.pdf>.

The book we are using focus on the fundamental theory of computability, decidability, and complexity. It is a bit different from the analysis of algorithms we usually do in our x7x series of classes at Berkeley.

There will be one assignment and one report each week, and they are all optional. More info can be found in following sections.

Prerequisites

The reader is expected to be at the beginning graduate level having studied some theory, or a student at the senior undergraduate level with good mathematical maturity. Specifically, the book uses sets, functions, graphs, induction, and recursive definitions freely. These concepts are all explained in an appendix, but the appendix may be too terse to serve as a first introduction to these notions. Familiarity with some programming language is a necessity; just which language is much less relevant ¹.

Assignment

The assignment for each week's reading is completely optional and will not be graded or any sort. You don't have to turn it in, but you are very welcome to post it in our Slack

¹as addressed by Jones in the book *Computability and Complexity*.

channel to share your answers with others. Also, feel free to discuss your solution with others either in our Slack channel or anywhere else.

All assignments are selected from the exercises in the book.

Report

Each week, you may write a report regarding the reading assigned for that week. This is also completely optional. You can write ANYTHING in your report. Thoughts, questions, complains, anything. Although there will be some suggested topics if you'd like some ideas. I hope you can find some fun in reading theory.

You may also post your reports to our Slack channel, and I am planning on posting our reports on the website (with your permission).

Running Schedule

Week	Reading	Exercise	Report Idea
1/6 - 1/12	Chapter 1 Toward the Theory	TBD	TBD
1/13 - 1/19	Chapter 2 Introduction to Computability section 4 - 7	TBD	TBD
1/20 - 1/26	Chapter 2 Introduction to Computability section 8 - 10	TBD	TBD
1/27 - 2/2	Chapter 3 Other Aspects of Computability Theory	TBD	TBD
2/3 - 2/9	Chapter 4 Introduction to Complexity section 15 - 18	TBD	TBD
2/10 - 2/16	Chapter 4 Introduction to Complexity section 19 - 22	TBD	TBD
2/17 - 2/23	Chapter 4 Introduction to Complexity section 23 - 24	TBD	TBD
2/24 - 3/1	Chapter 5 Complete Problems	TBD	TBD