Overview of Module 1

The very first module will introduce you to the technicalities of algorithms. This is in fact one of the longest modules by far in the entire specialization since there is a lot to do before we begin.

- We will look into insertion sort in great detail as a motivating algorithm for sorting.
- We will look at how computer scientists think about the running time of algorithms and look at asymptotic notation as a computer architecture/language/operating system independent means of evaluating algorithms.
- We will define worst case complexity.
- We will look at the asymptotic notation.
- We will study what it means to rigorously prove correctness of an algorithm through establishing inductive invariants that hold during the execution of the algorithm.
- We will study two algorithms: mergesort and binary search in this manner.

Assignments

We will have quizzes after most of the lessons in this module. These quizzes are choose the correct answer style and you will have unlimited attempts to solve them/get them right.

Programming Assignment

We will have a programming assignment that will help you approach the development of algorithms related to what we study in this module.

CLRS Chapter 2

Read Chapter 2 of CLRS.

2.1 Insertion Sort

2.2 Analyzing Algorithms

2.3 Designing Algorithms

CLRS Chapter 3

CLRS Chapter 3

3.1 Asymptotic Notation

3.2 Standard Notations and Common Functions

Recommended but not required: CLRS Appendix A.