Skeina – Chapter 2 Summary

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This chapter discusses the basic concepts of analyzing algorithms in terms of complexity, which can be translated into how efficiently the algorithm will be when running on an actual machine. The reason we analyze algorithms rather than implementations on a certain system or in a specific language is so that we can develop algorithms that will be effective no matter the environment or system you are programming in.

This chapter first touches on the RAM system of analyzing algorithms where, basically, number of operations used in an algorithm are totaled using a few special rules: each simple operation counts as one, loops and subroutines are counted by the number of simple operations within them, and each memory access is counted as one. Totaling this up gives you an estimation of time taken on a computer in terms of number of operations. This gives a way to compare different algorithms but it does ignore some issues within the three rules themselves.

The chapter then goes on to talk about “Big Oh” notation. This is a subject that I hadn’t seen much up until this course. I was very interested. I was a little lost on the formal definitions of the Big Oh notation because of the math notations, but I understand that Big Oh notation scraps any constants and simplifies down to terms of iterations, or rather number of items the algorithm is operating on. I believe my biggest take-away from this chapter was Figure 2.4 found at the top of pg. 38. This visual along with the Sort Comparisons assignment really made me understand the importance of developing efficient algorithms.

The last bit of the chapter goes on to talk about the different classifications of complexity within the Big Oh notation as well as how to analyze an algorithm with nested sections and other situations using the rules of complexity addition and multiplication. The book shows many examples of different complexities using sorts and searching algorithms.

The chapter finally finishes with some advanced cases that involve math well over my head. I don’t believe I have ever been exposed to log squared functions, epsilon symbols, or limits in terms of these dominance relations. This last part of the chapter kind of went over my head…