ALGORITHM-NOTES

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August 1, 2024

1 INTRODUCTION

1.1 What is an Algorithm

In mathematics and computer science, an algorithm is a finite sequence of well-defined, computer-implementable instructions, typically to solve a class of problems or to perform a computation. Algorithms are always unambiguous and are used as specifications for performing calculations, data processing, automated reasoning, and other tasks.

Definition 1.1 – Algorithm An algorithm is a finite sequence of well-defined, computer-implementable instructions, typically to solve a class of problems

Hence ther are some key points of an algorithm:

- An alogrithm need an **input** and an **output**.
- An algorithm is a sequence of conputational steps transfer input to output.

Example 1.1 Sorting problem
INPUT: A sequence of n numbers $< a_1, a_2, \cdots, a_n >$
OUTPUT: A permutation (recordering) $< a'_1, a'_2, \cdots, a'_n >$ of the input sequence such that $a'_1 \leq a'_2 \leq \cdots \leq a'_n$.

Therefore this algorithm provides a way to reorder the sequence in a descending order. The input sequence is called an **instance** of the sorting problem, and the output sequence is called a **solution** to the instance.