Correctness

It is ***impossible*** to design an algorithm to analyze if general algorithms are going to halt or not, emphasis on *general*. *Halting Problem*

With specific algorithms or base-cases in such algorithms it is possible to know when and how it will halt.

`TOPIC:` Correctness via induction

Induction Accepted axioms:

- Well-Ordering Principle (WOP):

  $$if X \subseteq \mathbb{N} = 0, 1, \ldots$$

  is nonempty, then X has a least element $\exists m \in X$ s.t. $m \leq x, \forall x \in X$

  *→ "LEAST" IN THIS CASE **DOES NOT** mean it is WITHIN THE BOUNDS. It means there is an element that is SMALLER THAN THE SMALLEST ELEMENT IN X !!!*

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