

Proof by Induction

Induction

- State the property $P(n)$ that you want to prove
 - This includes stating what n represents and for which n you are proving the statement (i.e. $n \geq 0$)
- Prove the base case
 - Often $P(0)$ or $P(1)$, but depends on what you're proving
- Assume $P(n)$ is true, and use it to prove $P(n+1)$
 - The assumption of $P(n)$ being true in this step is called the Induction Hypothesis
 - This step (proving $P(n+1)$) is called the Induction Step

Induction Examples

- Basic examples (including the “all horses are the same color” anti-example)
 - <https://www.cs.cornell.edu/courses/cs312/2002sp/handouts/induction/induct-examples.html>
- Sorites Paradox
 - https://en.wikipedia.org/wiki/Sorites_paradox
- Proof of Kruskal’s Algorithm
 - <http://tandy.cs.illinois.edu/Kruskal-analysis.pdf>