Paper for Introduction to Information and Computer Science Course

In this course, we started by exploring the definition of sets to understand set theory, and deepened our understanding through example problems.

Prove that there is no infinite sequence of sets $\{S_n\}_{n\in N}$ such that for all $n \in N$, $S_{n+1} \in S_n$.

Proof: By contradiction. Consider $S = \{S_n | n \in N\}$. S is a set since we have enumerated all its elements, which are all sets.
Since S is a set,there exists $S_x \in S$ such that $S_x \cap S = \emptyset$.
Since $S_{x+1} \in S$, $S_{x+1} \notin S_x$.
The above contradicts the defnition of sequence $(S_n)_{n\in N}$.