1. Prove that the set of stable models $SM(P)$ for a normal logic program $P$ is an antichain, i.e., if $M, N \in SM(P)$ and $M \subseteq N$, then $M = N$.

2. Suppose that you are given a linear order over a set of elements. You may assume that the set is described by a domain predicate $\text{Elem}(\cdot)$ whereas $\text{LT}(\cdot, \cdot)$ is used to represent the linear order amongst the elements.

Formalize the following concepts using rules in a uniform way, i.e., independently of the interpretations of the relations $\text{Elem}$ and $\text{LT}$.

(a) The minimum element of the order—captured by the relation $\text{Min}(\cdot)$.
(b) The maximum element of the order—captured by the relation $\text{Max}(\cdot)$.
(c) Which elements are immediate successors of each other—formalized as the relation $\text{Next}(\cdot, \cdot)$.

3. Write a normal logic program $P_{\text{queens}}^8$ which solves the problem of placing eight queens on a $8 \times 8$ chess board—not threatening each other.

4. Use the $\text{models}$ system to check how many solutions exist for the 8-queens problem as formulated above.