Write a formal, two-column proof of the following theorem:

\[ \forall s, s' : (s \rightarrow^* s') \iff (\exists n : (\vdash n : \text{nat}) \land (s \rightarrow^n s')) \]

Hint: Structure your proof as two subproofs, one for the if direction (\(\implies\)), and the other for the only-if direction (\(\iff\)), of the theorem.

Complete the assignment by yourself. At the end of your proof, write the following: “I pledge my Honor that I have not cheated on this assignment.” Sign your name after your pledge.