Exercise 6.1
Consider the following Kripke structure $\mathcal{K} = (S, A, \rightarrow, 0, AP, \nu)$, where $A = \{a, b, c, d, e\}$, $AP = \{p\}$, $\nu(6) = \{p\}$, and $\nu(s) = \emptyset$ if $s \neq 6$.

(a) Write down the maximal independence relation $I \subseteq A \times A$.

(b) Write down the maximal invisibility set $U \subseteq A$.

(c) Compute a reduction function $red$ that satisfies the ample set conditions C0–C3. Whenever possible, choose $red(s)$ such that it is a proper subset of $en(s)$, for each state $s$.

(d) Use $red$ to construct a reduced Kripke structure $\mathcal{K}'$ that is stuttering equivalent to the original Kripke structure $\mathcal{K}$. 
Solution 6.1

(a) \( I = \{(a, b), (a, c), (a, d), (b, c), (b, e), (c, d), (c, e), (d, e),
(b, a), (c, a), (d, a), (c, b), (e, b), (d, c), (e, c), (e, d)\}\)

(b) \( U = \{b, c, d\}\)

(c) \(\text{red}(0) = \{a, b\}, \text{red}(1) = \{c\}, \text{red}(2) = \{a, e\}, \text{red}(5) = \{d\}, \text{red}(4) = \{b, d\}, \text{red}(6) = \{a\}, \text{red}(7) = \{b\}, \text{red}(8) = \{d\}, \text{red}(9) = \{c\}, \text{red}(10) = \{b\}, \text{red}(12) = \{a\},\)

(d)