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 $\text{red}$ that satisfies the ample set conditions C0–C3. Whenever possible, choose $\text{red}(s)$ such that it is a proper subset of $en(s)$, for each state $s$.

(d) Use $\text{red}$ to construct a reduced Kripke structure $\mathcal{K}'$ that is stuttering equivalent to the original Kripke structure $\mathcal{K}$.
Exercise 6.2

Consider the following Promela model

```promela
byte g;

active proctype m() {
  byte x;
  m0: x ++;
  m1: x ++;
  m2: g = x;
}

active proctype n() {
  byte y;
  n0: y ++;
  n1: y ++;
  n2: atomic { (g>0) -> g = g - y }
}

active proctype p() {
  p0: atomic { (g>0) -> g -- }
}
```

and the following properties:

a) The value of g will eventually become one.

b) The process n cannot finish before the process m reaches m1.

For each property, define a labeled Kripke structure with actions extracted from program statements. Determine the independence relation and the invisibility set, and construct a reduced Kripke structure using the ample sets method.