1. Briefly define the following terms related to first-order logic:
   (a) Domain or domain of discourse
   (b) Term
   (c) Atomic sentence or atomic formula

2. Describe the components of a first-order interpretation.

3. (a) Translate the following sentence of first-order logic into good, natural English:

\[ \forall x, y, l \ SpeaksLanguage(x, l) \land \ SpeaksLanguage(y, l) \Rightarrow \ \\
Understands(x, y) \land \ Understands(y, x). \]  

(b) Explain why this sentence is entailed by the sentence

\[ \forall x, y, l \ SpeaksLanguage(x, l) \land \ SpeaksLanguage(y, l) \Rightarrow \ Understands(x, y). \]  

(c) Translate the following into first-order logic using the predicates \text{Understands} and \text{FriendOf}:
   i. Mutual understanding leads to mutual friendship.
   ii. Friendship is transitive (that is, my friend’s friends are my friends also).

4. Write out the axioms for reasoning about the wumpus’ location, using a constant symbol \text{Wumpus}, unary predicate \text{Smelly}, and binary predicates \text{In} and \text{Adjacent}. Hint: There is only one wumpus.