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:

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

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

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

   (c) Translate the following into first-order logic:
      i. Mutual understanding leads to mutual friendship.
      ii. Friendship is transitive.

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