

CS-661 AI Assignment 7

1. Predicate logic adds the quantifiers \forall and \exists . What connections are there between these quantifiers (DeMorgan laws). Do they commute?
2. Translate the following English statements into PROLOG if possible. If not, why not?
 1. Socrates is a mortal.
 2. All men are mortal.
 3. Athenians are Greek.
 4. Not all Greeks are Athenians.
 5. There is at least one Greek who is not Athenian.
 6. Clark Kent is really Superman.
 7. I am unique.
 8. The barber shaves someone iff he does not shave himself.
3. Translate the following predicate logic into PROLOG if possible. If not, why not?
 1. $\forall x : \text{cat}(x) \vee \text{dog}(x) \rightarrow \text{pet}(x)$
 2. $\forall x : \text{cat}(x) \rightarrow \neg \text{dog}(x)$
 3. $\forall x : \text{poodle}(x) \rightarrow \text{dog}(x) \wedge \text{small}(x)$
 4. $\exists x : \text{smart}(x)$
 5. $\exists x : \neg \text{smart}(x)$
 6. $\forall x \exists y : Q(x, y) \rightarrow P(x)$
4. Add sons of jacob, ishmael and esau to the example of the lecture. Define cousin in terms of grandfather. Check that your definition works. Define cousin in terms of father. Define parent and maternal cousin.