

PES University, Bangalore

Department of Computer Science and Engineering

Automata Formal Languages & Logic

Assignment for First Order Logic- Quantifiers, Terms, Axioms

1. Consider the following axioms:

- 1. Anyone who rides any Harley is a rough character.
- 2. Every biker rides [something that is] either a Harley or a BMW.
- 3. Anyone who rides any BMW is a yuppie.
- 4. Every yuppie is a lawyer.
- 5. Any nice girl does not date anyone who is a rough character.
- 6. Mary is a nice girl, and John is a biker.
- 7. If John is not a lawyer, then Mary does not date John.

2. Consider the following axioms:

- 1. Every child loves anyone who gives the child any present.
- 2. Every child will be given some present by Santa if Santa can travel on Christmas eve.
- 3. It is foggy on Christmas eve.
- 4. Anytime it is foggy, anyone can travel if he has some source of light.
- 5. Any reindeer with a red nose is a source of light.
- 6. If Santa has some reindeer with a red nose, then every child loves Santa.

3. Consider the following axioms:

- 1. Every investor bought [something that is] stocks or bonds.
- 2. If the Dow-Jones Average crashes, then all stocks that are not gold stocks fall.
- 3. If the T-Bill interest rate rises, then all bonds fall.
- 4. Every investor who bought something that falls is not happy.
- 5. If the Dow-Jones Average crashes and the T-Bill interest rate rises, then any investor who is happy bought some gold stock.