

- 1) Tony, Mike and John belong to the Alpine Club. Every member of the Alpine Club who is not a skier is a mountain climber. Mountain climbers do not like rain, and anyone who does not like snow is not a skier. Mike dislikes whatever Tony likes, and likes whatever Tony dislikes. Tony likes rain and snow.
 - a) Represent this KB in FOL, using a vocabulary that you will define
 - b) Using the resolution, prove that the KB logically entails that there is a member of the Alpine Club who is a mountain climber but not a skier.
- 2) Using rules in production systems, compute $\text{cmmdc}(a, b)$ (i.e. the greatest common divisor of a and b). Explain which is the initial working memory, the final working memory and how the rules defined are applied for $\text{cmmdc}(6, 9)$.
- 3) Write in the description logic language the following.

Companies whose managers are business school graduates who have each at least one technical degree.

Companies listed on the NASDAQ, whose managers are all Techies, and a Techie being someone with at least two technical degrees.

 - a) Explain all the nonlogical symbols that you use.
 - b) Let F_1 and F_2 the two concepts defined for the two types of companies in KB. Normalize the concept $[\text{AND } F_1 F_2]$