HOCHSCHULE LANDSHUT

Artificial Intelligence I

Resolution - A simple example

Resolution

Given the following knowledge base KB

$$KB \equiv (\neg Q \vee \neg P) \wedge (P \vee \neg Q \vee \neg R \vee \neg S) \wedge (Q \vee \neg S) \wedge (R \vee \neg S)$$

and $\alpha = \neg S$, show $KB \models \alpha$.

To prove $KB \models \alpha$ add the negated goal $\neg\alpha = S$.

S_1 : $\neg Q \vee \neg P$.

S_2 : $P \vee \neg Q \vee \neg R \vee \neg S$.

S_3 : $Q \vee \neg S$.

S_4 : $R \vee \neg S$.

S_5 : S.

- Resolve S_2 with S_5, giving S_6: $P \vee \neg Q \vee \neg R$.
- Resolve S_3 with S_5, giving S_7: Q.
- Resolve S_4 with S_5, giving S_8: R.
- Resolve S_6 with S_7, giving S_9: $P \vee \neg R$.
- Resolve S_8 with S_9, giving S_{10}: P.
- Resolve S_1 with S_{10}, giving S_{11}: $\neg Q$.
- Resolve S_7 with S_{11} giving the empty clause.