G53KRR: Exercise on answer extraction

Consider the following knowledge base (where run, $nothing$, now and $bear$ are constants):

S1 $\forall t \forall x (See(t, x) \wedge Dangerous(x) \supset BestAction(t, run))$

S2 $\forall t (\neg \exists x (See(t, x) \wedge Dangerous(x)) \supset BestAction(t, nothing))$

S3 $Dangerous(bear)$

S4 $See(now, bear)$

Show using resolution that the knowledge base entails $\exists x BestAction(now, x)$ and extract the answer (which action is it).

Answer

To do answer extraction, we need to add the answer predicate A to the query: $\exists x BestAction(now, x)$ becomes $\exists x (BestAction(now, x) \wedge \neg A(x))$
Its negation is $\forall x (\neg BestAction(now, x) \vee A(x))$.
Clauses:

C1 $[\neg See(t, x), \neg Dangerous(x), BestAction(t, run)]$

C2a $[See(t, f(t)), BestAction(t, nothing)]$

C2b $[Dangerous(f(t)), BestAction(t, nothing)]$

C3 $[Dangerous(bear)]$

C4 $[See(now, bear)]$

C5 $[\neg BestAction(now, x), A(x)]$ (this is from the negated sentence)

Derivation:

1. $[\neg See(t, bear), BestAction(t, run)]$ from C1 and C3, $x/bear$

2. $[BestAction(now, run)]$ from 1 and C4, t/now

3. $[A(run)]$ from 2 and C5, x/run

So the answer is: the best action is run.