Week 9

FOL-prove the query using resolution

Code:

```
#Define the knowledge base (KB)
   "food(Apple)": True,
  "food(vegetables)": True,
   "eats (Anil, Peanuts)": True,
  "alive(Anil)": True,
   "likes(John, X)": "food(X)", # Rule: John likes all food
  "food(X)": "eats(Y, X) and not killed(Y)", # Rule: Anything eaten and
not killed is food
   "eats(Harry, X)": "eats(Anil, X)", # Rule: Harry eats what Anil eats
   "alive(X)": "not killed(X)", # Rule: Alive implies not killed
  "not killed(X)": "alive(X)", # Rule: Not killed implies alive
# Function to evaluate if a predicate is true based on the KB
def resolve(predicate):
   # If it's a direct fact in KB
   if predicate in KB and isinstance (KB[predicate], bool):
       return KB[predicate]
   # If it's a derived rule
   if predicate in KB:
      rule = KB[predicate]
       if " and " in rule: # Handle conjunction
           sub preds = rule.split(" and ")
           return all(resolve(sub.strip()) for sub in sub preds)
       elif " or " in rule: # Handle disjunction
           sub preds = rule.split(" or ")
           return any(resolve(sub.strip()) for sub in sub preds)
      elif "not " in rule: # Handle negation
           sub pred = rule[4:] # Remove "not "
           return not resolve(sub pred.strip())
       else: # Handle single predicate
           return resolve(rule.strip())
```

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# If the predicate is a specific query (e.g., likes(John, Peanuts))
   if "(" in predicate:
       func, args = predicate.split("(")
       args = args.strip(")").split(", ")
       if func == "food" and args[0] == "Peanuts":
           return resolve("eats(Anil, Peanuts)") and not
resolve("killed(Anil)")
       if func == "likes" and args[0] == "John" and args[1] == "Peanuts":
           return resolve("food(Peanuts)")
   # Default to False if no rule or fact applies
  return False
# Query to prove: John likes Peanuts
query = "likes(John, Peanuts)"
result = resolve(query)
# Print the result
print(f"Does John like peanuts? {'Yes' if result else 'No'}")
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Output:

Does John like peanuts? Yes

Observation:

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| | create a knowledgeBake consisting of first order logic statements and prove the query using resolution. |
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| (9) | Anyone who is not killed is alive. |
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