29/12/2023

Lab-7

⇒ Q(1) Create a knowledge based using propositional logic & show that the given query entails the knowledge base or not.

Algorithm:

KnowledgeBase class:

→ initialization:

```
def __init__(self):
    self.clauses = []
```

→ Create an instance of Knowledgebase class with an empty list

→ Adding a clauses:

Appends a new clause to the list of clauses in the knowledge base.

→ Resolving clauses:

Combine two clauses by resolving

→ Negate the Query:-

obtain the negation of query.

→ Combine with knowledge Base:

→ Check satisfiability:

```
def satisfiability():
    Check the conjunction is given by
```

Code(1)

```
from sympy import symbols

def create_knowledge_base():
    p = symbols('p')
    q = symbols('q')
    r = symbols('r')

    knowledge_base = And(Implies(P,q), Implies(q, Not(r)))

    return knowledge_base

def query_entails(knowledge_base, query):
    entailment = satisfiable(And(knowledge_base, Not(query)))

    return not entailment

if __name__ == "__main__":
    kb = create_knowledge_base()
    query = symbols('p')
    result = query_entails(kb, query)

    print("knowledge Base", kb)
    print("Query", query)
    print("query entail knowledg base", result)
```

Output:

```
knowledge base : r & (implies(P, q)) & (implies(q, r))
Query : p
Query entails knowledge base : False
```

Output:

```
Knowledge Base: ~r & (Implies(p, q)) & (Implies(q, r))
Query: p
Query entails Knowledge Base: False
```

```
[ ]  Start coding or generate with AI.
```