Date:- / /
Page No.:-

AI Assignment - 6

Name : Niraj Amrutkar.
Roll No. : 332002
PRN : 22010910
Batch : B1.

Aim: Implementation of unification algorithm by considering resolution concept.

Objective:

1.) Understand and implement the resolution concept.
2.) Understand unification algo.

Theory:

Unification Algorithm:-

Unification is a process of making two different logical atomic expression identical by finding a substitution unification depends on substitution process. It takes two literals as input and makes them identical using substitution. The unify algorithm is used for unification, which takes two atomic sentences & returns a unifier for those sentences. Unification is a key component of all first-order inference algorithms. It returns fail if the expression

do not match with each other. The substitution variables are called Not General Unifier or MGU.

Condition for unification :-

Predicate symbols must be the same atoms or expressions with the different predicate symbols can never be unified.

The number of arguments in both the expressions must be identical unification will fail if there are two similar variables present in the same expression

Resolution is theorem proving technique that proceeds by building resolution proofs. It is used if there are various statements given and we need to prove conclusion of statements it is a key concept in proofs resolution. Resolution is single inference rule which can efficiently operate an conjuctive normal form or clausal form. This rule is also called binary resolution rule it resolves exactly literals.

Implementation of algorithm :-

Step 1 : Initialize the substitution set to be empty.

Step 2 : Recursively unify atomic sentences.

a) Check for identical expression match
b) if one expression is a variable v_i and the other term t_i which does not contain variable v_i then —
   → Substitute t_i / v_i in the existing substitutions.
   → Add t_i / v_i in the substitution setlist.
   → if both the expression are functions then the function name must be similar & the number of arguments must be same in both expressions.

Conclusion :

In this way, I have implemented unification algorithm considering the resolution concept.