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# Lab Assignment - 4

Title: Implementation of Unification algorithm.

Aim: To implement Unification algorithm.

Objective: To study and implement Unification algorithm.

Theory:

→ Unification Algorithm
In logic and compute science unification is an algo. proces of solving equations between symbolic expressions. A unification algorithm should compute for a given problem a complete and minimal substitution set that is a set covering all its solutions and containing no redundant members.

→ Resolution as proof ~~procedure~~ procedure.
Resolution is a ~~theory~~ theorem proving technique that proceeds by building refutation proofs, i.e proofs by contradictions. It was invented by a mathematician John Alan in 1965. Resolution is used if there are various statement are given and we need to prove a conclusion of ~~these~~ those statements Unification is a key concept in proofs by resolution Resolution is a single inference rule which can efficiently operate on the conjuctive normal form or ~~to~~ clausal form.

→ Steps:
→ Conversion of facts into first order logic.
→ Convert ~~for~~ FOL statements into CNF

→ Negate the statements into ~~CNF~~ which needs to prove.
→ Draw resolution graph (unification)

Input: Two literals L1 & L2

Output: A set of substitution

Algorithm: Unification algorithm

FAQ

1 Why Resolution is required
Resolution is used if there are various statements are given and we need to prove a conclusion of those statement unification is a key concept in proofs by resolutions

2 What are pre-requisites for applying unification algorithm
1] Predicate symbol must be same, atoms or expression with different predicate symbol can never be unified
2] Number of arguments in both expression must be identical.
3] Unification will fail if there are two similar variables present in the same expression

3 What are the applications of unification algorithm
1] Logical programming
2] Programming language type system implementation
3] Cryptographic Protocol analysis.
4] Term rewriting algorithm
5] SMT solvers.