04 TECOMP B
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IIS Practical

Aim: To solve a reasoning problem using unification.

Theory:

In logic and computer science, unification is an algorithm process of solving equations between symbolic expressions. Depending on which expressions are allowed to occur in an equation set, and which expressions are considered equal several frameworks of unification are distinguished. If higher-order variables, that is, variable representing functions, are allowed in an expression, the process is called higher-order unification, otherwise first-order unification. If a soln is required to make both sides of each eqn. literally equal, the process is called syntatic or free unification, otherwise semantic or equational unification.

Consider unifying the literal $P(x, g(x))$ with:

1. $P(z, y)$: unifies with $\{x/z, g(x)/y\}$
2. $P(z, g(z))$: unifies with $\{x/z\}$ or $\{z/x\}$
3. $P(Socrates, g(Socrates))$: unifies, $\{Socrates/x\}$
4. $P(z, g(y))$: unifies with $\{x/z, x/y\}$ or $\{z/x, z/y\}$
5. $P(g(y), z)$: unifies with $\{g(y)/x, g(g(y))/z\}$
6. $P(socrates, f(Socrates))$: does not unify: f and g do not match.
7. $P(g(y), y)$: does not unify: no substitution works

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 is term t_i which does not contain variable v_i then
   a. Substitute t_i/v_i in the existing substitutions
   b. Add t_i/v_i to the substitution setlist.
   c. If both the expressions are functions, then function name must be similar and the no. of arguments must be same in both the expression.

Conclusion:

The successfully applied unification algorithm to solve a reasoning problem using python in pycharm editor.

Viva Questions

Q1) What is Enviornment?

Enviornment is the surrounding in which agent acts, percievrs using sensors and acts using actuators

Q2) Components of AI?

Components of AI are

Environment,
Sensors,
Actuators,
Problems.

Q3) What is BFS?

BFS is the algorithm for searching in the tree. It is known as Breath First search algorithm. It checks the searches node specific node level by level. It comes under Uninformed search. It gives you the result for sure.

Q4) What is DLS?

Ans. DLS is the Depth limiting search. It is the Depth first search with the ~~height~~ depth limit. It can give the result if the result is present the depth, It is used because but if the node is present after the given depth is doesn't search it. It was made to stop DFS from going in infinite loop.

Q5) Disadvantages of DFS?

Ans
- It can ~~give~~ go in to infinite loop and will never give you the result
- It takes much time.

Q6) How AI is used in computer vison?

Ans. AI is used in computer vision with making 2D images 3D.