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**AI ASSIGNMENTS**

**Assignment – 7**

Known facts: fever, cough.

Rules:

* If fever and cough → flu
* If flu and sore\_throat → infection
* If fever → infection

#include <bits/stdc++.h>

using namespace std;

// Rule structure

struct Rule {

vector<string> premises;

string conclusion;

};

// Check if all premises are in the set of known facts

bool canFire(const Rule &rule, const set<string> &facts) {

for (string p : rule.premises)

if (facts.find(p) == facts.end())

return false;

return true;

}

// Forward Chaining Algorithm

void forwardChaining(vector<Rule> &rules, set<string> &facts, string goal) {

bool addedNewFact;

do {

addedNewFact = false;

for (auto &rule : rules) {

if (canFire(rule, facts) && facts.find(rule.conclusion) == facts.end()) {

facts.insert(rule.conclusion);

cout << "Inferred: " << rule.conclusion << endl;

addedNewFact = true;

if (rule.conclusion == goal) {

cout << "Goal '" << goal << "' reached!" << endl;

return;

}

}

}

} while (addedNewFact);

cout << "Goal '" << goal << "' not reached." << endl;

}

int main() {

// --- Facts ---

set<string> facts = {"fever", "cough"};

// --- Rules ---

vector<Rule> rules = {

{{"fever", "cough"}, "flu"},

{{"flu", "sore\_throat"}, "infection"},

{{"fever"}, "infection"}

};

string goal = "infection";

forwardChaining(rules, facts, goal);

cout << "\nFinal Facts: ";

for (auto f : facts) cout << f << " ";

cout << endl;

return 0;

}

