CSC 429 Assignment 4
Expert System Project Report

Overview

In this project, I have built a working expert system using forward chaining. where a computer concludes a set of facts and IF–THEN rules. In this, I have completed the missing parts in the code that was provided. The parts where I have completed code were in file engine.py, kb/laptop_rules.json, and main.py. Together, these components allow the system to take user inputs, convert them into facts, apply the rules, and generate a laptop recommendation.

engine.py

In engine.py, I implemented the missing run(self), can_fire(rule), and conclusions(self). Incan_fire(rule), I have it return True if all antecedents of the rule are already in the fact set and the consequent has not been added yet. In run(), I implement a forward chaining loop so it will check all the rules, and run the rule whose conditions are satisfied, and I added a conclusion to the facts and record the rule name in the trace so I can use it in the main class. The loop stops when no new rules can be fired. In the **conclusions(),** I implemented this so the engine separates final facts into three categories: recommendations, specifications, and other facts that were given by the user.

kb/laptop_rules.json

In kb/laptop_rules.json, only 1 rule is given before, so I have to add nine additional IF–THEN rules, giving a total of ten rules. I added rules for: budget_low/medium/high, portable, Long_battery, gaming, creative_work, office_only, pref_os_windows/macos/linux, needs_ai_accel, large_screen, travel_often

main.py

In this load rules load_rules(). In this, I added multiple questions for the user to get the information from them. Based on the response I got, I turned it into facts and sent it to the inference engine. In the inference engine, it runs and checks the rules, and based on the rules, it prints the recommendation, the rule from which we got the recommendation, the fact that the suggested specs, and all the other facts the system learned from the user's input.