PROJECT'S SHORT DESCRIPTION

MEAL PLANNER

CS – 6364 501 Artificial Intelligence

Department of Computer Science

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Problem Description:

The idea is to implement a logical agent (computer program) with a capability of assisting cooking recipes of specific cuisine from available ingredients and suggest restaurants from where to get the specific cuisine based on user's location.

Proposed Solution and Implementation Details:

The input for this logical agent is cuisine type, ingredients and current location. The desired output is list of cooking recipes which use one, some or all of those ingredient(s) as core ingredient(s) as well as restaurant providing those cuisine. Agent will first use the knowledge base to show all such recipes which has the main ingredient listed by user.

Scenario:

Sample Input:

- Cuisine: Italian
- Ingredients: Avocado, tomato, pasta, cheese
- Current Location : Waterview Parkway at W Campbell Road

KB (in OWL):

1. "Avocado, Tomato and Mozzarella Pasta Salad" hasIngredient "Avocado"
2. "Avocado, Tomato and Mozzarella Pasta Salad" hasIngredient "Tomato"
3. "Avocado, Tomato and Mozzarella Pasta Salad" hasIngredient "shell pasta"
4. "Avocado, Tomato and Mozzarella Pasta Salad" hasIngredient "mozzarella cheese"
5. "mozzarella cheese" isTypeOf "cheese"
6. "shell pasta" isTypeOf "pasta"

Inferred facts:

1. "Avocado, Tomato and Mozzarella Pasta Salad" hasIngredient "cheese"
2. "Avocado, Tomato and Mozzarella Pasta Salad" hasIngredient "pasta"

Sample Output:

- Recipe: Avocado, Tomato and Mozzarella Pasta Salad
- Places: Cappuccino Italian Bistro (0.6 mile) , Aboca's Italian Grill (3.2 miles)

RDF File contains:

- Ingredients list with cooking recipes
- Multiple Cuisine type
- Restaurant lists with distance

Using the cooking domain knowledge and inference, the logical agent will show the recipe(s) as listed above. Next step is to show the restaurants in order of shortest path from the current location. Performing A* algorithm on the map of restaurants will lead to the nearby restaurants which can serve specific cuisine. Restaurants will be listed based on shortest path and distance. It can be more than one recipes based on user's input and KB. Also it can be one or more restaurants in nearby area providing such cuisine. Design and implementation also includes one admissible and one inadmissible heuristic in the informed search to find an optimal results.

Programming Tools:

Implementation for this specific project requires 3 main components which includes building ontology for cooking domain, use an API to extract this data for the JAVA IDE such as eclipse and programming for composing all and displaying a user friendly GUI to the user.

1. Protégé: An open source tool to build and view OWL/ RDF ontology in Cooking Domain.
2. JENA/OWL API: To add extra semantics to RDF data as well as to use inbuilt data of OWL/RDF file.
3. JAVA Eclipse IDE: Open Source IDE with JAVA support, JAVA is used as programming language to develop GUI application for user to enter input and see output.

Architectural Diagram: