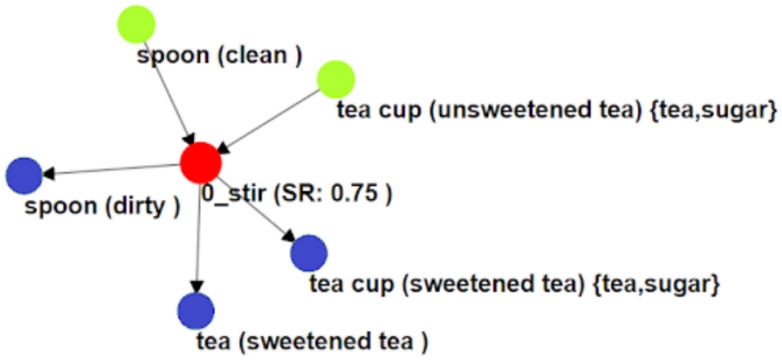
CAP5625 - Introduction to AI
Project 1: Knowledge Retrieval
Part 1

In this project, you will be introduced to a knowledge representation for robots called FOON (Functional Object-Oriented Network). This representation is a graph that contains information about how objects can be used in certain tasks and manipulations to do things. Each action (represented by the connections to a motion object in red) is contained within a structure called a functional unit. The goal of the Part 1 is to get familiar with the FOON's data structure and the way the information is represented and the nodes are organized.

Here is a functional unit for example:



This unit shows that two items, a clean spoon and a cup of unsweetened tea and sugar, can be used in a stirring action to create a cup of unsweetened tea. The JSON equivalent for this is the following:


```
{
    "input_nodes": [
        {
            "label": "tea cup",
            "states": ["unsweetend"],
            "ingredients": ["tea", "sugar"],
            "container": null
        },
        {
            "label": "spoon",
            "states": ["clean"],
            "ingredients": [],
            "container": null
        }
    ],
    "motion_node": "stir",
    "output_nodes": [
        {
            "label": "tea",
            "states": ["sweetend tea"],
            "ingredients": [],
            "container": "tea cup"
        },
        {
            "label": "tea cup",
            "states": ["sweetend tea"],
            "ingredients": ["tea", "sugar"],
            "container": null
        },
        {
            "label": "spoon",
            "states": ["dirty"],
            "ingredients": [],
            "container": null
        }
    ]
}
```

A single action is represented by a functional unit. To depict a more intricate action, multiple functional units are required. The collection of functional units that outlines the strategy for completing a task is referred to as a task tree. In this project, each student will receive three task trees, accessible here:https://drive.google.com/drive/folders/1CdpLOY7AMVFqzU5KKdUn1G_9NpF7rIim?usp=sharing
After understanding how FOON trees are represented, you are tested with three trees. Each of you are provided with a folder that matches your name.

Task
Each folder has three text files that contains recipe instruction. It also has three task trees in JSON format for the three recipes. The task trees are produced by Generative Models. So, it is likely that it has some inaccuracies in it. Your job is to check if the instructions in the text files are correctly represented in the task tree. Report any mistake in the task tree and make correction if found any. For each task tree, check the following things:

1. The task tree format is correct. Each functional unit has motion node, input node and output node.
2. There is no incorrection motion.
3. No step is missing.
4. The state is being changed correctly as an effect of the motion.

If you find any error, make corrections.

Submission

1. Your comment on what mistakes are there in the task trees. You can submit it as a comment on Canvas or in a text file.
2. The three text files that has the recipe instructions. Don't make any change there. Just submit what you were provided.
3. The three corrected JSON files.

Evaluation
Your corrected task tree will be evaluated by another students. The evaluator will check if the corrected task tree has any mistake.

Due Date
Deadline for the assignment: 09/15.
Deadline for the peer review is 09/18.