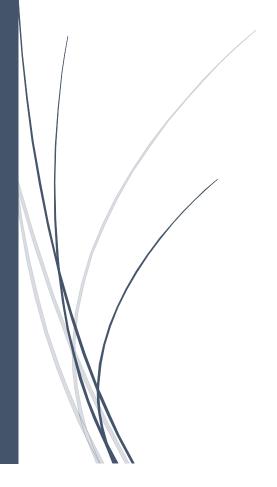3/29/2024

Frames-Assignment

Artificial-Intelligence

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BIT 6TH SEMESTER

1. **How knowledge is represented using frames? Represent the following using frames.**
   Ram is name of an employee. His age is 27. He is male. He belongs to the department HR, where the number of employees is 110 and the average salary of the department is Rs. 45000. All departments are under Tribhuvan University. The organization type of Tribhuvan University is Educational.

➢ In artificial intelligence and knowledge representation, frames are a way of organizing and representing knowledge in a structured format. A frame is a data structure that consists of slots (attributes or properties) and values associated with those slots. Frames help in capturing the hierarchical relationships and properties of objects or concepts. Here is how knowledge is represented using frames:

- **Conceptualization:** Frames begin with the conceptualization of a particular entity or concept. This could be anything from objects in the physical world to abstract concepts.
- **Slot-Value Pairs:** Each frame contains slots, which represent specific aspects or attributes of the concept, and values associated with those slots. For example, a "Car" frame might have slots for "Manufacturer", "Model", "Year", "Color", etc., each with corresponding values.
- **Hierarchy:** Frames can be organized hierarchically, with more general concepts at higher levels and more specific concepts at lower level. For instance, there might be a "Vehicle" frame that contains common attributes shared by all vehicles, with "Car" and "Truck" frames as subtypes, each with their own additional attributes.
- **Inheritance:** Frames can inherit attributes and values from other frames in the hierarchy. For example, a "Car" frame might inherit attributes like "Manufacturer" and "Model" from the "Vehicle" frame.
- **Default Values:** Frames can have default values for slots, which are used when specific values are not explicitly provided. This helps in simplifying knowledge representation and inference.
- **Relations:** Frames can represent relationships between different concepts or entities. These relationships can be represented using slots that point to other frames.
- **Frames Interconnection:** Frames can be interconnected to represent complex relationships and knowledge structures. For example, a "Person" frame might have slots for "Name", "Age", and "Employment" , where the "Employment" slot points to a frame representing the person's job detail.

A frame is a record like structure which consists of a collection of attributes and its values to describe an entity in the world. Frames are the AI data structure which divides knowledge into substructures by representing stereotypes situations. It consists of a collection of slots and slot values. These slots may be of any type and sizes. Slots have names and values which are called facets. The various aspects of slot is known as **Facets.**

Employee Frame:

Slots	Filters
Name	Ram
Age	27
Gender	Male
Department	HR
Number of Employees in Department	110
Average Salary in Department	Rs. 45000

Department Frame:

Slots	Filters
Name	HR
Number of Employees	110
Average Salary	Rs. 45000
Organization	Tribhuvan University

Organization Frame:

Slots	Filters
Name	Tribhuvan University
Type	Educational

2. **Using your own assumptions, design PEAS framework for following intelligent agents.**
    - **Covid-19 prediction system**
    - **Vaccine recommender system**

> **Covid-19 prediction system:**
>   - **Performance:** Predict the likelihood of an individual having Covid-19
>   - **Environment:** Medical facilities, hospitals, clinics, or wherever individuals may seek healthcare services.
>   - **Actuators:** Generate predictions, alert healthcare providers, recommend testing, suggest isolation measures, etc.
>   - **Sensors:** Collect data such as symptoms, travel history, contact with infected individuals, test results, demographic information, etc.

> **Vaccine recommender system:**
>   - **Performance:** Recommend suitable vaccinees to individuals based on various factors such as age, medical history, location, etc.
>   - **Environment:** Healthcare facilities, pharmacies, online platforms where individuals seek vaccine information.
>   - **Actuators:** Provide vaccine recommendations, offer information about vaccine availability, schedule vaccination appointments, etc.
>   - **Sensors:** Collect data on individual's medical history, age, location, vaccine preferences, current health status, vaccination guidelines, etc.