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ARTIFICIAL INTELLIGENCE (18CSC305J) LAB
EXPERIMENT 8: Implementation of knowledge representation schemes

Aim:

To implement knowledge representation schemes

Problem Description:

- Humans are best at understanding, reasoning, and interpreting knowledge. Human knows things, which is knowledge and as per their knowledge they perform various actions in the real world.
- But how machines do all these things comes under knowledge representation and reasoning. Hence we can describe Knowledge representation as following:
- Knowledge representation and reasoning (KR, KRR) is the part of Artificial intelligence which concerned with AI agents thinking and how thinking contributes to intelligent behavior of agents.
- It is responsible for representing information about the real world so that a computer can understand and can utilize this knowledge to solve the complex real world problems such as diagnosis a medical condition or communicating with humans in natural language.
- Semantic networks are alternative of predicate logic for knowledge representation. In Semantic networks, we can represent our knowledge in the form of graphical networks. Semantic networks can categorize the object in different forms and can also link those objects.

Problem Formulation:

```
((canary  (is-a bird)
        (color yellow)
        (size small))
  (penguin (is-a bird)
        (movement swim))
   (bird    (is-a vertebrate)
        (has-part wings)
        (reproduction egg-laying)))
```

CODE:

Language: Python

nouns={0:"cat",1:"dog",2:"human",3:"whale",4:"dolphin",5:"pigeon",6:"eagle",7:"mammal",8:"bird",9:"animal"}

adj=[[0 for i in range(10)] for j in range(10)]

adj[0][7]=1

adj[1][7]=1

adj[2][7]=1

adj[3][7]=1

adj[4][7]=1

adj[5][8]=1

adj[6][8]=1

adj[7][9]=1

adj[8][9]=1

def dfs(v):

  print(nouns[v])

  vis[v]=1

  for i in range(10):

    if adj[v][i] and not vis[i]:

```
        dfs(i)
print("Implementation of 'is a' relation\n")
for i in range(7):
    print(f"Relation {i+1}")
    vis=[0 for i in range(10)]
    if vis[i]==0:
        vis[i]=1
        dfs(i)
```

TEST CASE:

```
Implementation of 'is a' relation

Relation 1
cat
mammal
animal
Relation 2
dog
mammal
animal
Relation 3
human
mammal
animal
Relation 4
whale
mammal
animal
Relation 5
dolphin
mammal
animal
Relation 6
pigeon
bird
animal
Relation 7
eagle
bird
animal
```

Verification:

Test Case 1:-

- Cat is a mammal
- Mammal is an animal
- Hence, Cat is an animal

Result: Hence, we successfully implemented knowledge representation schemes and verified the output and documented the result.