# Properties of Knowledge Representation

1.  Simple Relational Knowledge

2.  Inheritable Knowledge

3.  Inferential Knowledge
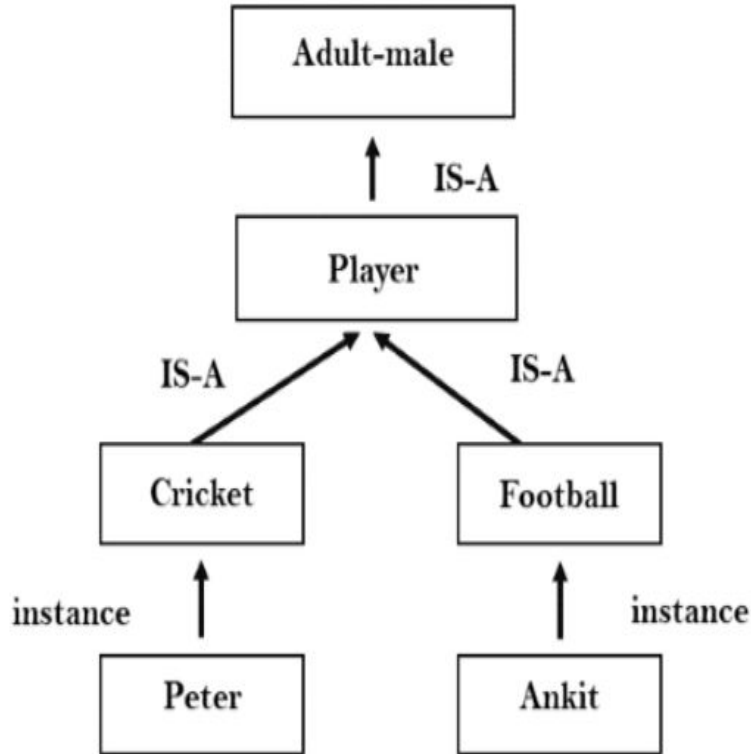
4.  Procedural Knowledge

# Simple Relational Knowledge

- simplest way of storing facts which uses the relational method

- each fact represented systematically in columns

- famous in database systems where the relationship between different entities is represented

| Player | Weight | Age |
|--------|--------|-----|
| Player1 | 65 | 23 |
| Player2 | 58 | 18 |
| Player3 | 75 | 24 |

# Inheritable Knowledge



- all data must be stored into a hierarchy of classes

- All classes should be arranged in a generalized form or a hierarchical manner

- apply inheritance property

- Elements inherit values from other members of a class

- This approach contains inheritable knowledge which shows a relation between instance and class, and it is called instance relation.

- objects and values are represented in Boxed nodes

- use Arrows which point from objects to their values

# Procedural Knowledge

- Procedural knowledge approach uses small programs and codes which describes how to do specific things, and how to proceed.

- In this approach, one important rule is used which is **If-Then rule**.

- In this knowledge, we can use various coding languages such as **LISP language** and **Prolog language**.

- We can easily represent heuristic or domain-specific knowledge using this approach.

# Techniques of Knowledge Representation
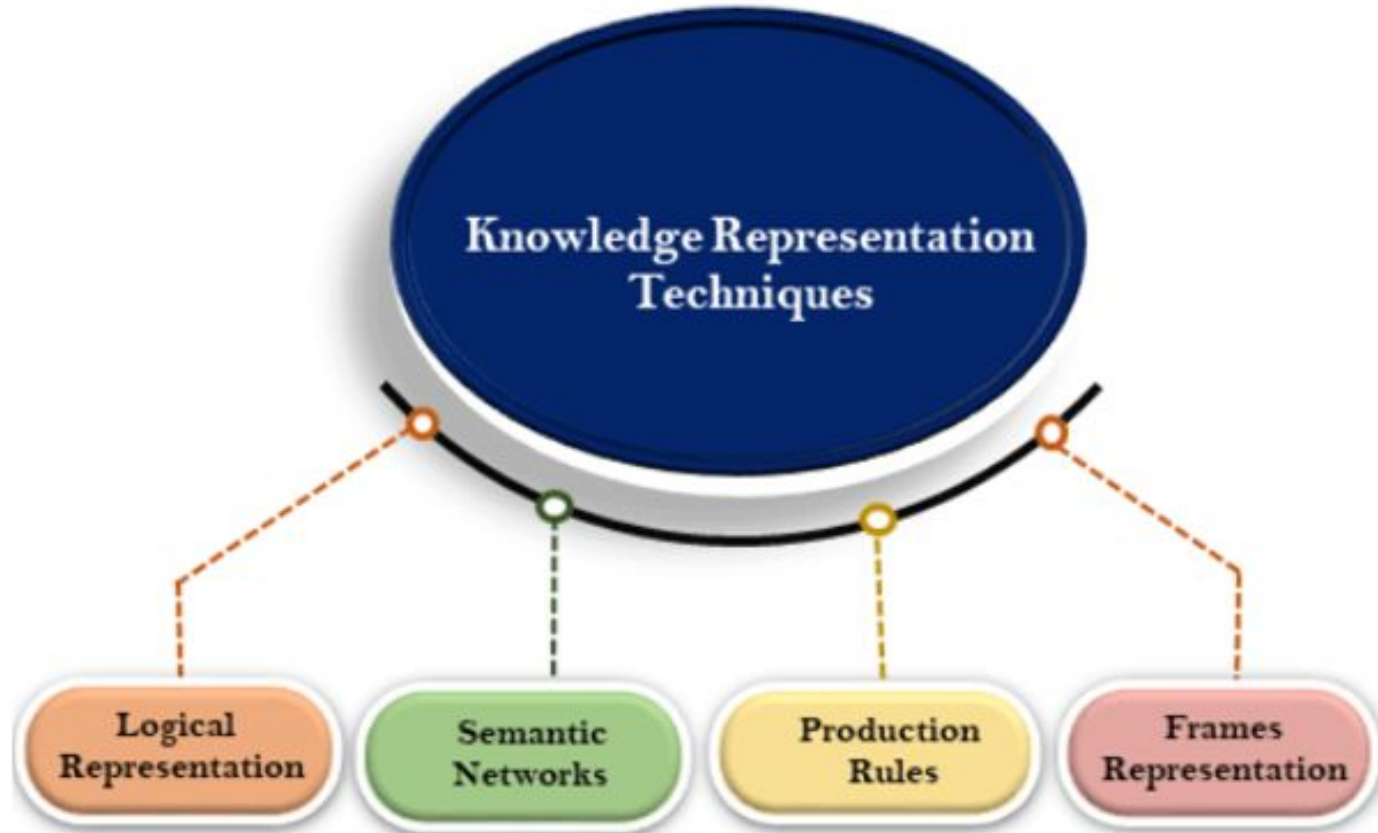
# Semantic Network Representation

- alternative of predicate logic for knowledge representation

- represent our knowledge in the form of graphical networks

- consists of nodes representing objects and arcs which describe the relationship between those objects

- easy to understand and can be easily extended

- This representation consist of mainly two types of relations:

  - IS-A relation (Inheritance)

  - Kind-of-relation

# Semantic Network Representation

## Statements:

a.  Jerry is a cat.

b.  Jerry is a mammal

c.  Jerry is owned by Priya.

d.  Jerry is white colored.

e.  All Mammals are animal.
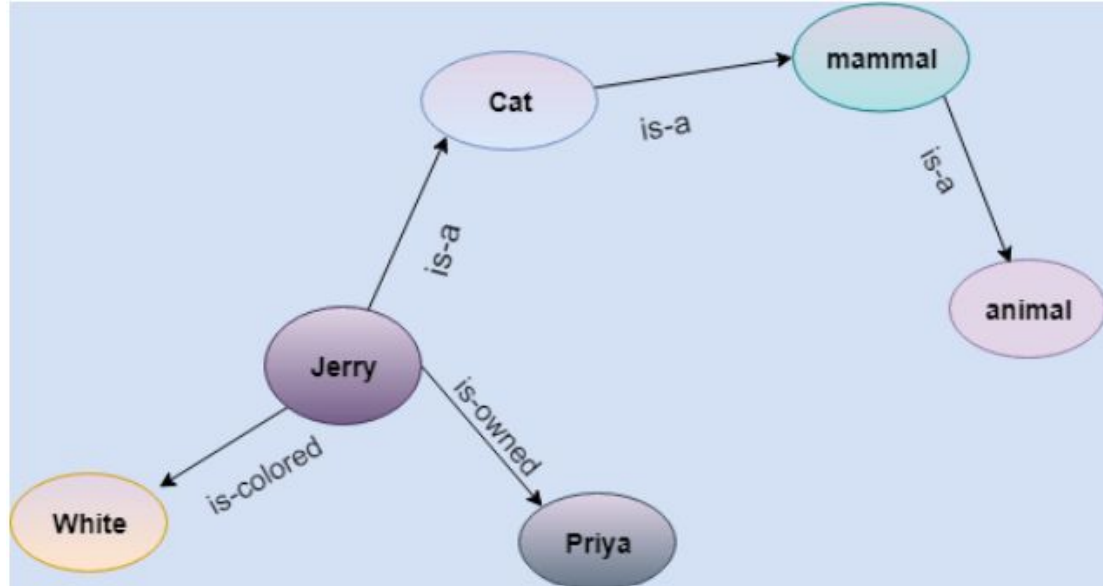
# Frame Representation

| Slots | Filters |
|-------|---------|
| Title | Artificial Intelligence |
| Genre | Computer Science |
| Author | Peter Norvig |
| Edition | Third Edition |
| Year | 1996 |
| Page | 1152 |

# Production Rules

- consist of (**condition, action**) pairs which mean, "If condition then action"

Example:

- ○ **IF (at bus stop AND bus arrives) THEN action (get into the bus)**

- ○ **IF (on the bus AND paid AND empty seat) THEN action (sit down).**

- ○ **IF (on bus AND unpaid) THEN action (pay charges).**

- ○ **IF (bus arrives at destination) THEN action (get down from the bus).**