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**Assignment 3: Perform Parsing of Family Tree Using Knowledge-Base**  
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**Problem Statement:**  
Implement a knowledge-based system to parse and represent a family tree. The system should store family relationships and allow queries such as identifying parents, children, siblings, and ancestors.  
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**Objectives:**

* Understand the concept of knowledge-based systems.
* Represent family relationships using facts and rules.
* Implement parsing and querying of a family tree.  
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**Theory:**  
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**Methodology:**  
A knowledge-base stores facts and rules about relationships in a structured format. In a family tree, individuals are represented as entities, and relationships (like parent, child, sibling) are represented as facts. Using a reasoning engine, queries can be processed to infer relationships or retrieve family information.  
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**Working Principle / Algorithm:**  
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**Family Tree Parsing Algorithm:**

1. Define facts for family members (e.g., parent(John, Mary).).
2. Define rules for relationships (e.g., sibling(X,Y) :- parent(Z,X), parent(Z,Y), X \= Y.).
3. Store facts and rules in the knowledge base.
4. Input queries to the system (e.g., “Who are the children of John?”).
5. The system parses the query and retrieves results using inference rules.
6. Repeat for different queries to explore the family tree.  
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**Advantages:**

* Provides a structured representation of family relationships.
* Supports automated querying and inference.
* Easy to expand with new members and relationships.  
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**Disadvantages / Limitations:**

* Complexity increases with large family trees.
* Requires careful definition of facts and rules to avoid inconsistencies.  
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**Diagram:**

*John*

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*Mary Paul*

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*Alice Bob Lisa*  
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**Conclusion:**  
Knowledge-based systems enable efficient representation and querying of family relationships. Parsing a family tree using a knowledge base allows automatic inference of relationships and simplifies complex queries about ancestry and family structure.  
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