**Assignment No: 3**

**Problem Statement:-**

Perform parsing of a family tree using a knowledge base.

**Theory:-**

A **Family Tree** is a hierarchical diagram representing relationships between family members across generations. A **Knowledge Base** is a structured collection of information (facts and rules) that can be used to infer relationships between individuals within the tree. Parsing a family tree involves understanding and determining relationships such as parents, siblings, children, grandparents, etc., using a set of logical rules.

* **Facts**: These are direct relationships provided in the family tree, such as "X is the parent of Y."
* **Rules**: Logical rules infer relationships from facts, such as if "X is the parent of Y" and "Y is the parent of Z", then "X is the grandparent of Z."

**Methodology:-**

1. **Define Relationships**:
   * **Parent(X, Y)**: X is a parent of Y.
   * **Child(X, Y)**: X is a child of Y.
   * **Sibling(X, Y)**: X and Y share the same parents.
   * **Ancestor(X, Y)**: X is an ancestor of Y if X is a parent or grandparent of Y.
2. **Knowledge Representation**: Use facts to represent the family members' relationships and rules to infer additional relations.
   * In **Prolog** or any logic-based programming, facts and rules could look like this:

parent(john, mary).

parent(mary, alice).

sibling(mary, paul).

1. **Parsing and Inference**:
   * Use forward chaining or backward chaining to derive new relations, such as determining whether someone is a grandparent or cousin.
   * Query examples:
     + grandparent(john, alice) would return true or false based on the facts and rules defined.
2. **Visualization** (Optional): After parsing, the relationships can be visualized using tree structures or graphs to make the family structure easier to understand.

**Conclusion:-**

We parsed the family tree using the knowledge base and inferred relationships like siblings, parents, and ancestors by applying logical rules.