**Assignment No: 8**

**Problem Statement:**

Implement the Backward Chaining Algorithm.

**Theory:**

Backward Chaining is a goal-driven inference method that starts with a specific goal and works backward to find the facts that support it. This technique is particularly useful in systems where we need to determine if a goal can be achieved based on the existing knowledge.

**Methodology:**

1. Define Rules:
   * Create a collection of rules in the form of "If-Then" statements. For example:  
     If (A is true), then B is true.
2. Start with a Goal:
   * Begin with the goal or query you wish to prove or disprove. For instance, you might want to ascertain whether a particular condition is true (e.g., "Is the patient diagnosed with disease X?").
3. Backward Search:
   * The algorithm recursively searches backward to identify facts that can fulfill the goal based on the existing rules.
   * During this process, sub-goals may be generated, and the algorithm attempts to satisfy these sub-goals using the available facts and rules.
4. Applications:
   * Legal Reasoning: Backward chaining is employed to prove legal claims by checking if a series of conditions (facts) can substantiate a legal conclusion.
   * Rule-Based Systems: It is utilized in expert systems to validate whether specific rules lead to a desired goal.

**Conclusion:**

We successfully implemented the backward chaining algorithm to trace backward from a goal to verify if it can be supported by existing facts, demonstrating the effectiveness of this goal-driven inference method.