**Assignment No: 6**

**Problem Statement:**

Implement basic search strategies for the 8-Queens Problem.

**Theory:**

The 8-Queens Problem is a well-known puzzle that requires placing eight queens on an 8x8 chessboard in such a way that no two queens threaten each other. This means that no two queens can occupy the same row, column, or diagonal.

**Methodology:**

1. State Representation:
   * Model the chessboard as a list of 8 elements, where each index corresponds to a row, and the value at each index indicates the column in which a queen is placed.
2. Constraints:
   * Ensure that no two queens share the same row, column, or diagonal.
   * Diagonal conflicts can be identified by checking if the absolute difference between the row indices equals the absolute difference between the column indices.
3. Search Strategies:
   * Backtracking: Recursively attempt to place queens in valid positions. If a conflict occurs, backtrack and explore alternative positions.
   * Heuristics: Employ strategies like the Least Constraining Value to minimize conflicts and expedite the search process.
4. Optimizations:
   * Implement advanced techniques such as local search or constraint propagation to enhance the efficiency of finding solutions.

**Conclusion:**

We successfully tackled the 8-Queens Problem using backtracking, systematically exploring all valid configurations to ensure that no two queens could attack each other.

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