Name : Alok Bhawankar
Roll : PA06
Panel : 1

AI Lab Assignment No : 03

* Title : Implementation of solution of Constraint Satisfaction Problem like
SEND + MORE = MONEY or CROSS + ROADS = DANGER

* Objective : To study constraint satisfaction method and solve two problem such as
SEND + MORE = MONEY or CROSS + ROADS = DANGER

* Theory - Write in brief

1 Constraint Satisfaction Method.

- In AI, it is the process of finding a solution to a set of constraints that imposes conditions that variables must satisfy.
- A solution is therefore a set of values for the variables that satisfies are constraints in the feasible region.
- The techniques used depend on the kind of constraint being considered often, used are constraints on a finite domains, to the point that constraints satisfaction problems are typically identified with problem based on finite domain.

2 BackTracking Search

- It is an exhaustive search algorithm DFS that systematically assigns are possible combinations of value to vaccines.

- It is complete in the sense that it is guaranteed to find a solution if one exists.
- There are numerous techniques for improving the efficiency of backtracking a good recording, back jumping, heuristics for variable and value ordering, etc.
- The best combinations of these techniques of to result in algorithms that can routinely solve large difficult instances in reasonable amount of time.

3. Constraint Propagation

- A number of inference techniques use the constraints to infer which variable value pairs are consistent & which are not.

- These include node, arc, path, and k-consistent using the constraints to reduce the number of legal values for a variable which in turn can reduce legal values for another variables.

* INPUT - Initial values for some letters in problem.

* OUTPUT - Unique values for letters S, E, N, D, M, O, R, Y.
or C, R, O, S, F, I, D, M, G, E

* Algorithm - Constraint Satisfaction method

3 Why backtracking search can be used to solve constraint satisfaction problems?

Ans: Backtracking search uses DFS approach It systematically assigns all possible combination of values to variables and checks if these assignments constitute to a solution or not. The best combinations often find a effective solution if it exists.

* Conclusion : Thus, implement solution of constraints satisfaction Problem.

* Platform - Linux

* FAQ's

1. What are other constraint satisfaction problems?

Ans: 1. Crypt Arithmetic coding alphabets to numbers
2. n-Queen (n queens should be placed in nxn matrix such that no queen share same row, column, diagonal)
3. Map coloring (coloring different regions of map ensuring no adjacent regions have same color
4. Crossword
5. Suduko (Number grid)
6. Latin Square Problem

2 What do you mean by constraint propagation?

ans: Constraint propagation embleds any reasoning which consist in explicity forbidding values or combination of values for some variables of a problems because a given subset of its constraints cannot be satisfied otherwise.

3.