

Artificial Intelligence

Spring Semester 2020

Homework VII (CO6)

Grade

Max. Marks: 25

Student Name: _____

Student ID: _____ Section: 2418 Signature: _____

Answer all the questions as follows:

1. What is CSP? Also discuss its components.

2. Using the CSP, perform the tasks given on the right side to color the Australian map as follows.



Where $D = \{\text{red, green, blue}\}$ is the domain and $C = \{\text{neighboring regions to have distinct colors}\}$ is the set of constraints.

1. Draw the constraint graph.
2. Write all possible constraints in the form of $\langle \text{scope, rel} \rangle$ pairs.
3. Find the solution map.

Student Name: _____ Student ID: _____

3. Define the following types of constraints.

- a. Unary constraints
- b. Binary constraints
- c. High order constraints
- d. Global constraints

4. Crypto arithmetic is a type of puzzle consists of encrypted letters. The goal is to decrypt the encrypted letters with digits. Find the encrypted digits from 0 to 9 for the letters in this addition e.g. SEND + MORE = MONEY. The resultant sum cannot start with a zero digit. Evaluate all mathematical steps in the form of a tree and finally provide a solution.

5. Define backtracking search and also write down its algorithm.

6. Discuss the following heuristics.
 - a. MRV heuristics
 - b. Degree heuristics
 - c. Least constraining value heuristics

7. Discuss the following inference techniques.

- a. Forward checking
- b. Arc consistency

8. Discuss the intelligent backtracking.