**INTRODUCTION TO ARTIFICIAL INTELLIGENCE COM526**

**WEEK 5 ACTIVITIES**

Note: You will need to combine **Week 1 to Week 5** activities in a portfolio to be submitted as one document AE1 in November 2021. Please insert the number of words for each section, include references and examples in each. Feel free to be creative and support your answers by adding diagrams, your own drawings, smart charts etc, where appropriate.

The answers to the following tasks must be included in the portfolio.

1. Describe redundant paths in TREE-SEARCH and explain how we can avoid them?

1. One strategy to solve Constraint Satisfaction Problems is the backtracking approach. Describe its main steps in a few lines.

Backtracking search is an uninformed algorithm utilised to solve CSPs. Backtracking picks one variable at a time and assigns it and then continues down the tree considering only values which do not conflict with the previously assigned variables. If the search reaches a dead end or a conflict it will backtrack up until it finds a variable that can have its value changed. If it goes all the way up to the start (root) this means No solution.

1. Consider the following scenario: you are in charge of scheduling for computer science classes that meet Mondays, Wednesdays and Fridays. There are 4 classes that meet on these days and 3 professors who will be teaching these classes. You are constrained by the fact that each professor can only teach one class at a time.

The classes are:

1. Class 1 - Programming: meets from 8:00-9:00am

2. Class 2 - Artificial Intelligence: meets from 8:30-9:30am

3. Class 3 – Machine Learning: meets from 9:00-10:00am

4. Class 4 - Computer Vision: meets from 9:00-10:00am

The professors are:

1. Professor A, who is qualified to teach Classes 1 and 2.

2. Professor B, who is qualified to teach Classes 3 and 4.

3. Professor C, who is qualified to teach Classes 1, 3, and 4.

Formulate this problem as a constraint-satisfaction problem (CSP) in which there is one variable per class, stating the domains and constraints. Constraints should be specified formally and precisely by filling up the table below.

|  |  |  |
| --- | --- | --- |
| Variables | Domains | Binary Constraints |
| C1 | {A, C} | C1 ≠C2 |
| C2 |  |  |
| C3 |  |  |
| C4 |  |  |

1. Read on “Responsible AI” practices and write a short paragraph to explain why developing a framework is important.

(Total Number of words: \_\_\_\_)