Republic of the Philippines
Laguna State Polytechnic University
Province of Laguna

Assessment Task No. 4			
Topic:	**Monotonic vs. Non-Monotonic Reasoning**	**Week No.**	9
Course Code:	**CSST101**	**Term:**	1st Semester
Course Title:	**Advance Knowledge Representation and Reasoning**	**Academic Year:**	2025-2026
Student Name		**Section**	
Due date		**Points**	

Learning Outcomes Assessed

After completing this assessment, students should be able to:

1. Explain the key features of **non-monotonic reasoning**.
2. Apply logical reasoning that adapts when new information is added.
3. Construct examples of **argumentation frameworks** showing conflicting knowledge.
4. Demonstrate understanding of belief revision through code or written explanation.

Assessment Title:

"When Logic Changes: Exploring Non-Monotonic Reasoning and Argumentation"

Part I. Conceptual Understanding (20 points)

Instruction:
Answer the following questions briefly but clearly. Each question is worth 4 points.

1. Define **non-monotonic reasoning** in your own words.
2. How does non-monotonic reasoning differ from monotonic reasoning?
3. Give a real-life situation where a conclusion must change after new information is added.
4. What is a **default rule**? Provide one example.
5. How do argumentation frameworks help AI systems decide between conflicting rules?

Rubric:

- 4 pts – clear, accurate, example-supported answer
- 3 pts – mostly correct, minor errors
- 2 pts – incomplete or unclear
- 1 pt – incorrect or irrelevant

Part II. Laboratory Application (40 points)

Task 1: Belief Revision Simulation (20 points)

Objective: Implement a simple reasoning program in Python or R that revises conclusions when new information is added.

Instructions:

1. Create a program that starts with the rule:
   "If an animal is a bird, assume it can fly."
2. Ask the user to input the animal name.
3. If the animal is a known exception (like penguin or ostrich), revise the conclusion.
4. Display the system's reasoning process step-by-step.

Sample Output:

```
Input: penguin
Reasoning: Penguins are birds.
However, penguins do not fly.
Conclusion: penguins cannot fly.
```

Rubric:

Criteria	Excellent (5)	Good (4)	Fair (3)	Needs Improvement (2–1)
Correct logical flow	Complete & accurate	Mostly accurate	Minor issues	Incomplete
Program output clarity	Clear reasoning steps	Somewhat clear	Basic	Unclear
Code quality	Efficient & well-structured	Functional	Some redundancy	Many errors
Comments/documentation	Fully commented	Some comments	Few comments	None

Task 2: Argumentation Framework (20 points)

Objective: Create a simple argument diagram showing conflicting knowledge and how the stronger argument prevails.

Example Scenario:
Rule 1: Birds can fly.
Rule 2: Penguins are birds that cannot fly.
Fact: Tweety is a penguin.

Expected Answer:
Argument A: Birds can fly.
Argument B: Penguins are birds that cannot fly.
→ **Argument B defeats A**, because it is more specific.

Rubric:

- 10 pts – complete diagram or description
- 5 pts – includes clear reasoning steps
- 5 pts – shows correct defeat or resolution

Students can draw this using **draw.io**, **Canva**, or on paper.

Part III. Reflection and Discussion (20 points)

Instruction: Write a short essay (150–200 words) answering the prompt below.
"Think of a time when you changed your conclusion after learning new information. How is this similar to non-monotonic reasoning in AI?"

Rubric:

Criteria	Excellent (5)	Good (4)	Fair (3)	Poor (2–1)
Relevance to topic	Strong connection to AI reasoning	Mostly relevant	Limited relation	Off-topic
Insight & reflection	Deep and thoughtful	Some insight	Simple restatement	Superficial
Clarity & grammar	Clear and polished	Minor errors	Understandable	Hard to read

Total Points: 80

Component	Points
Part I – Conceptual	20
Part II – Laboratory	40
Part III – Reflection	20
Total	**80 pts**