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BSCS 3B

Part I. Conceptual Understanding

1. Define non-monotonic reasoning in your own words.

    - Non-monotonic reasoning is a way of thinking where conclusions can change if new information comes in, just like how people adjust their beliefs day to day.

2. How does non-monotonic reasoning differ from monotonic reasoning?

    - It differs from monotonic reasoning, where once something is concluded, it cannot be undone by adding new facts. Non-monotonic reasoning allows revising or retracting conclusions when exceptions or new data appear.

3. Give a real-life situation where a conclusion must change after new information is added.

    - A real-life example is weather prediction. Initially I conclude it will be sunny based on the forecast, but if I then learn that a storm warning was issued, I change my conclusion to expect rain.
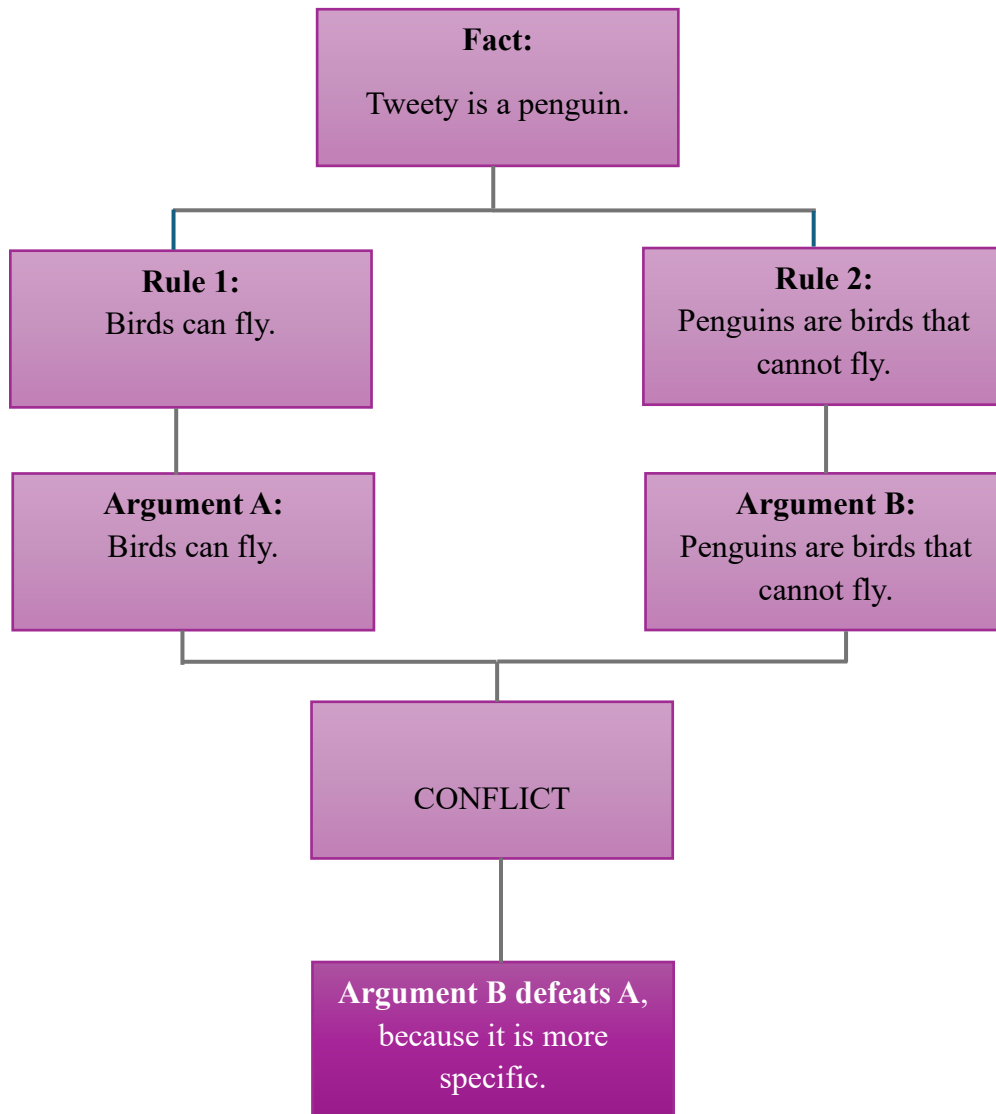
4. What is a default rule? Provide one example.

    - A default rule is an assumption made in reasoning when there is no information to the contrary. For example, "Birds typically fly" can be a default rule, assuming a bird can fly unless told it cannot.

5. How do argumentation frameworks help AI systems decide between conflicting rules?

    - Argumentation frameworks help AI by structuring conflicting rules as arguments attacking or defending each other. The AI evaluates which positions hold based on these interactions, helping it choose the most reasonable conclusion despite conflicting rules.

Task 2: Argumentation Framework

Fact:

Tweety is a penguin.

Rule 1:
Birds can fly.

Rule 2:
Penguins are birds that cannot fly.

Argument A:
Birds can fly.

Argument B:
Penguins are birds that cannot fly.

CONFLICT

Argument B defeats A, because it is more specific.

Part III. Reflection and Discussion

In daily life, it is common to change one's mind after acquiring new knowledge. I remember a time when I hadn't noticed a group project member attending conversations, so I was certain they were not contributing. They weren't committed, I decided. After speaking with them, though, I found out that they had been working on their part at home because of a family emergency. I appreciate their effort and have since changed my initial conclusion in considering this new knowledge.

Non-monotonic reasoning in artificial intelligence (AI) is comparable to this experience. When new knowledge challenges assumptions, AI systems can adjust their opinions because of non-monotonic reasoning. Non-monotonic logic reflects how people actually think, acquiring new information and changing assumptions, in compared with classical logic, which fixes conclusions once they are reached. This approach was reflected in my revised conclusion, which suspended assumptions in order to take into consideration opposing new facts. This flexibility helps AI systems in managing uncertainty and incomplete input, resulting in more flexible and practical conclusions. So, the need to reconsider conclusions when circumstances change is reflected in both human reasoning and non-monotonic AI reasoning.