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FUNDAMENTALS OF ARTIFICIAL INTELLIGENCE

LAB 2: LOGIC

Lecture: Bùi Tiến Lên

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A. Student's information:

- Name: Đặng Ngọc Tiến
- ID: 20127641

B. Test case:

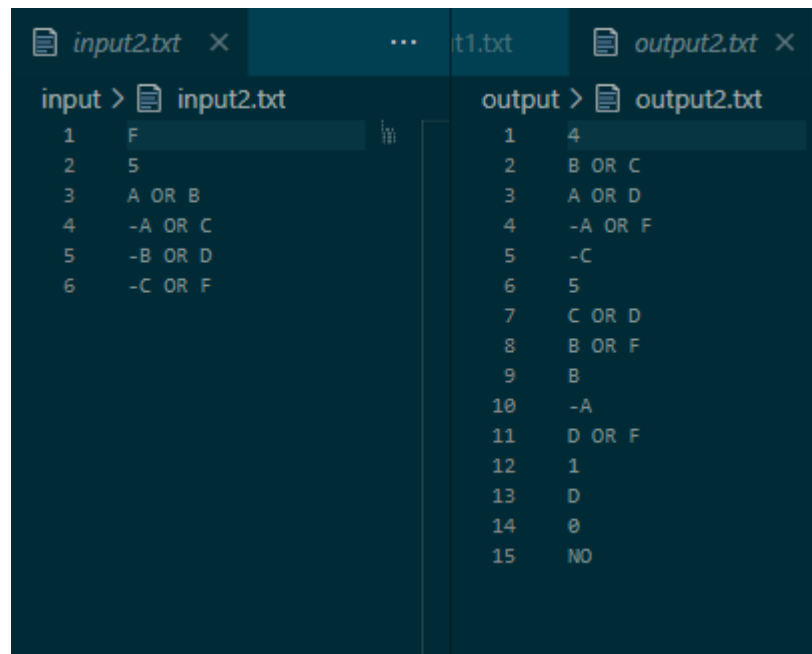
1. Input and output 1:



The screenshot shows a code editor with two files: `input1.txt` and `output1.txt`. The `input1.txt` file contains six lines of text, and the `output1.txt` file contains six lines of text. The lines are numbered 1 through 6.

Line	Input	Output
1	B	4
2	4	-B OR C
3	-A OR C	-A
4	-A OR B	A
5	A OR -B	{}
6	B	YES

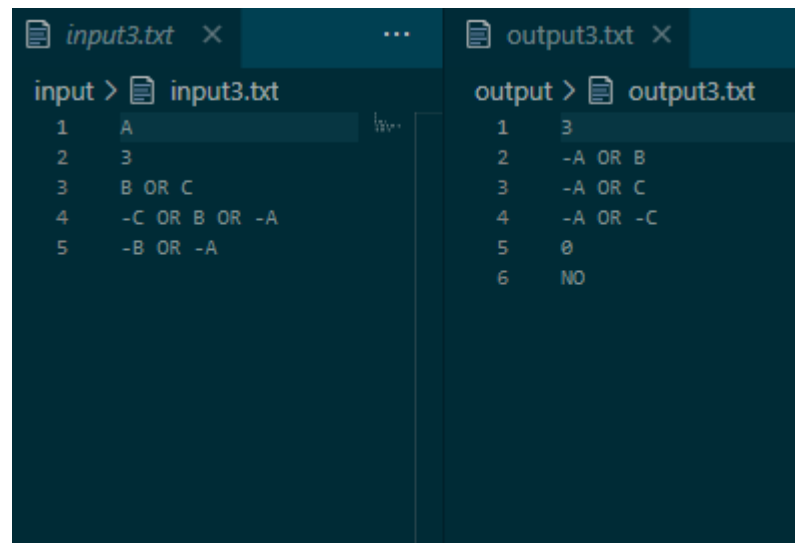
2. Input and output 2



The screenshot shows a text editor with two tabs: `input2.txt` and `output2.txt`. The `input2.txt` tab is active, showing a list of 6 items. The `output2.txt` tab is also visible, showing a list of 15 items. The input and output are as follows:

Input	Output
1 F	1 4
2 5	2 B OR C
3 A OR B	3 A OR D
4 -A OR C	4 -A OR F
5 -B OR D	5 -C
6 -C OR F	6 5
	7 C OR D
	8 B OR F
	9 B
	10 -A
	11 D OR F
	12 1
	13 D
	14 0
	15 NO

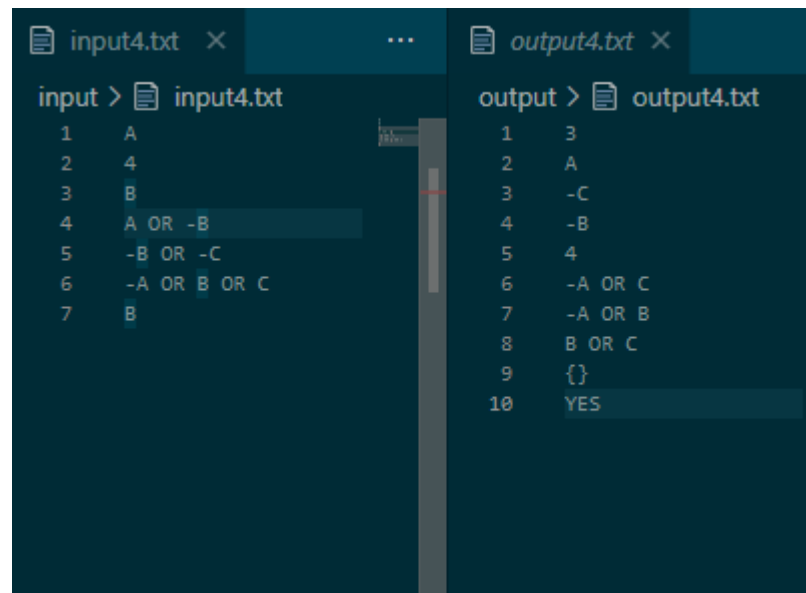
3. Input and output 3:



The screenshot shows a text editor with two tabs: `input3.txt` and `output3.txt`. The `input3.txt` tab is active, showing a list of 5 items. The `output3.txt` tab is also visible, showing a list of 6 items. The input and output are as follows:

Input	Output
1 A	1 3
2 3	2 -A OR B
3 B OR C	3 -A OR C
4 -C OR B OR -A	4 -A OR -C
5 -B OR -A	5 0
	6 NO

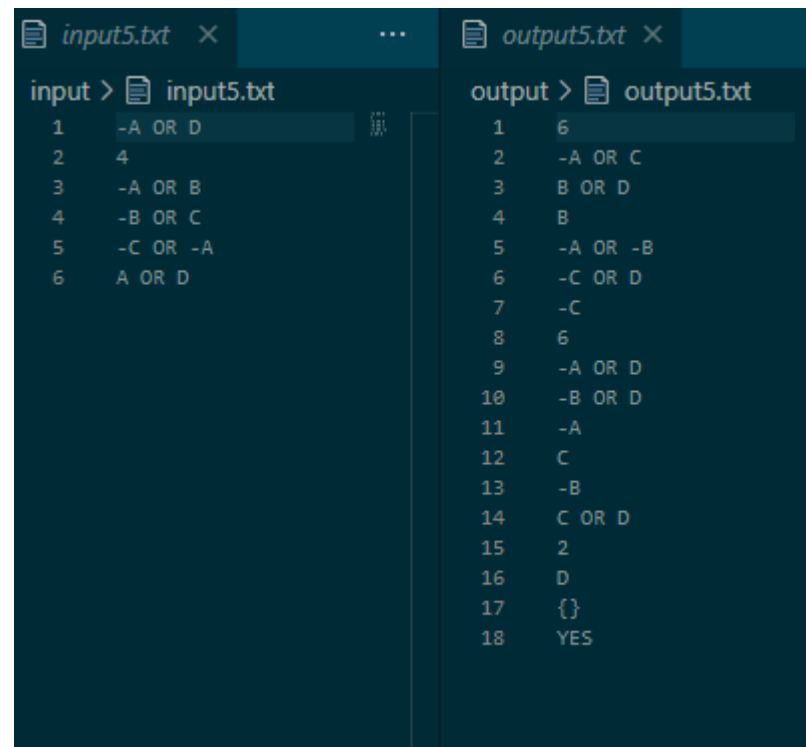
4. Input and output 4:



The screenshot shows a code editor with two files: `input4.txt` and `output4.txt`. The `input4.txt` file contains 7 lines of text, and the `output4.txt` file contains 10 lines of text. The lines are numbered 1 through 7 for input and 1 through 10 for output.

Line	Input	Output
1	A	3
2	4	A
3	B	-C
4	A OR -B	-B
5	-B OR -C	4
6	-A OR B OR C	-A OR C
7	B	-A OR B
		B OR C
		{}
		YES

5. Input and output 5:



The screenshot shows a code editor with two files: `input5.txt` and `output5.txt`. The `input5.txt` file contains 6 lines of text, and the `output5.txt` file contains 18 lines of text. The lines are numbered 1 through 6 for input and 1 through 18 for output.

Line	Input	Output
1	-A OR D	6
2	4	-A OR C
3	-A OR B	B OR D
4	-B OR C	B
5	-C OR -A	-A OR -B
6	A OR D	-C OR D
		-C
		6
		-A OR D
		-B OR D
		-A
		C
		-B
		C OR D
		2
		D
		{}
		YES

C. Pros and Cons of propositional logic:

1. Pros:

- Propositional logic is declarative: pieces of syntax correspond to facts
- Propositional logic allows partial/disjunctive/negated information
- Propositional logic is compositional
- Meaning in propositional logic is context-independent

2. Cons:

- Propositional logic has very limited expressive power.
E.g., Cannot say “pits cause breezes in adjacent squares” except by writing one sentence for each square.

3. Proposed Solutions:

- Shorten the rule: The rule of reduction: It is possible to remove the events on the right if those events have occurred on the left side. If after reduction, the right side becomes empty, then the rule is obvious. We can remove obvious rule from knowledge.
- Redundant rule: A rule is said to be redundant if it can be inferred from the rest.
- ...