

Logic and Control:

Name: _____

Lesson 12

Date: _____

AND Statement - a statement that is true if both of its parts are true.

OR Statement - a statement that is true when one or both of its parts are true.

Ladder Logic - a relay logic diagram that uses ladder diagrams to represent logic operations

Truth Table - a table with the outputs from all possible combinations of the inputs

Switch - a control mechanism that allows a variable's value to change the flow of a program

Engage

Fill out the truth table for the AND and OR Circuits from Slides 7 and 8.

A Switch (on/off)	B Switch (on/off)	A AND B	A OR B
Off	Off	Off	Off
Off	On	Off	On
On	Off	Off	On
On	On	On	On

Explore

Your instructor will show a sample code. Fill out the table below with your predictions. After watching ORA run the code, fill out the observation column.

Switch Values	Prediction	What you observed
A=0, B=0	Answers May Vary	Evo light is red Evo Says "Zero" Evo Says "Zero"
A=0, B=1	Answers May Vary	Evo light is Blue Evo Says "Zero" Evo Says "One" Finger Grippers Close and Open
A=1, B=0	Answers May Vary	Evo light is Blue Evo Says "One" Evo Says "Zero" Finger Grippers Close and Open
A=1, B=1	Answers May Vary	Evo light is Green Evo Says "One" Evo Says "One" ORA Moves to A1 and Picks up Evo

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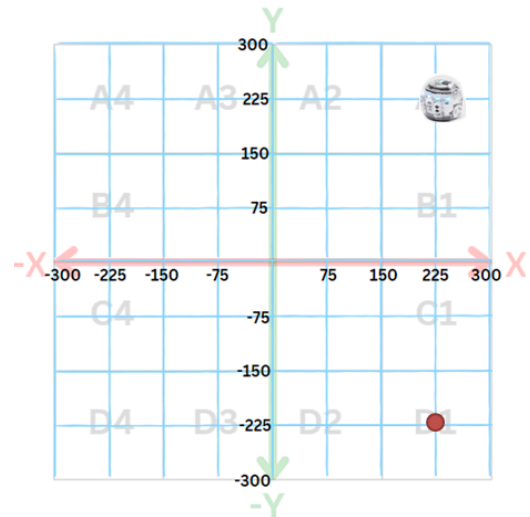
Date: _____

Elaborate

In this challenge, students will receive a pre-constructed ladder logic diagram with functions in place for the missing code blocks. Students will fill out the four functions to satisfy the ladder logic diagrams for both an AND and OR statement.

Task Requirements:

1. Students must make changes to the [ElaborateL12Code](#) (Share Code: xe3m394).
2. Students must ONLY change the functions, not the above code.
3. Students must create functions to satisfy the [ladder logic diagrams](#).
4. Students must run the program with the AND logic and the OR logic statements.
5. ORA must finish in the Initial Position.



Pseudocode	Code Blocks
	Answers may vary slightly, but here is an example solution Link or Share Code: y2jw4ze

After testing your code, what were the primary differences between using AND logic and OR logic? Answers may vary, but the OR logic should finish sooner

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Evaluate

Please answer the following prompts.

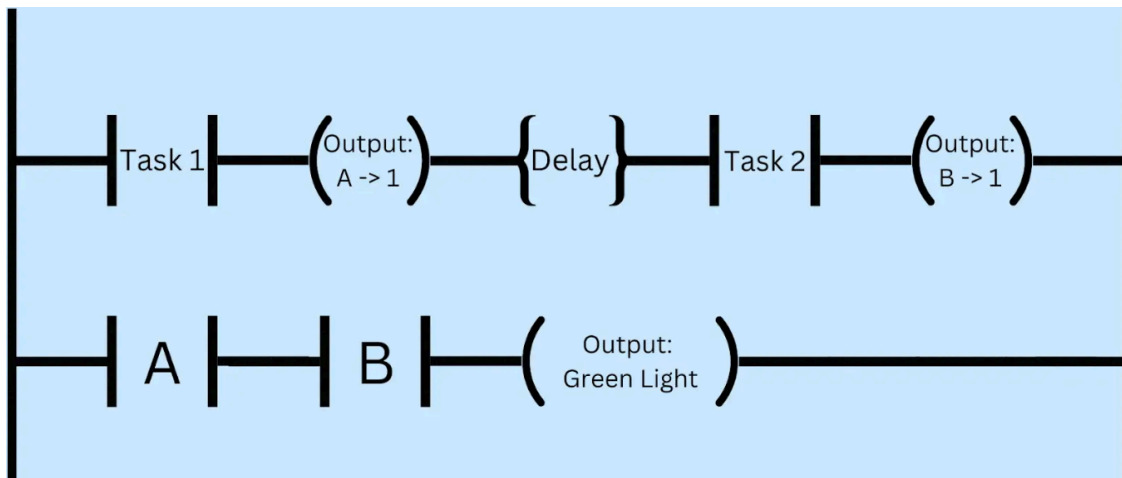
Remember to include your **name** and **date** on this paper!

1. In our ladder logic diagrams, how do variables (A and B) act like switches?
Which value is 'on' and what value is 'off'?

Answers may vary, but students may refer back to the circuit example and say that the code only progresses if the switch is "on." On is 1 and off is 0.

2. Complete and label the Ladder Logic Diagrams for AND and OR logic:

AND solution:



OR solution:

