Security System Project

* Indicates required question

1. Email *

2. You are part of a 4 engineer team working on creating a security system for a small local business. Decide with your team which member will take each section and then click on your section below to begin your part. You will later be directed on how to combine your design with the other members of your team. * 1 point

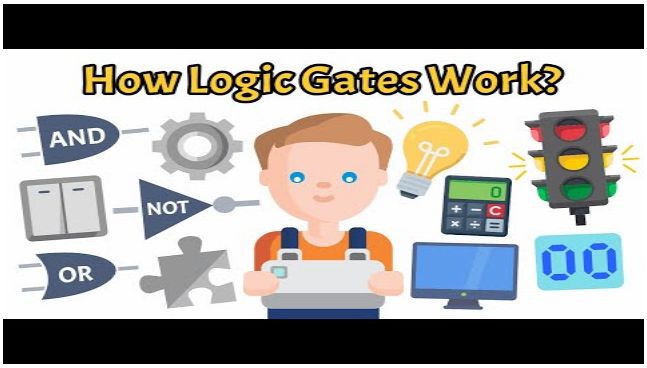
Mark only one oval.

- Exterior Breach Sensor *Skip to question 3*
- Accidental Triggering Prevention *Skip to question 6*
- Disarming System Design *Skip to question 9*
- Design Integration Specialist *Skip to question 12*

Exterior Breach Sensors

3. Your task is to create a logic gate that will trigger the alarm system (light the LED) when either the door or the window is breached (Either one of this will give a high output and will trigger the alarm. What kind of logic gate will you build? * 1 point
Type your answer using all uppercase letters

Watch this video if you need more help understanding logic gates



http://youtube.com/watch?v=9kNO9iKgT1I

TRUTH TABLES

A.

Input	Output
0	1
1	0

B.

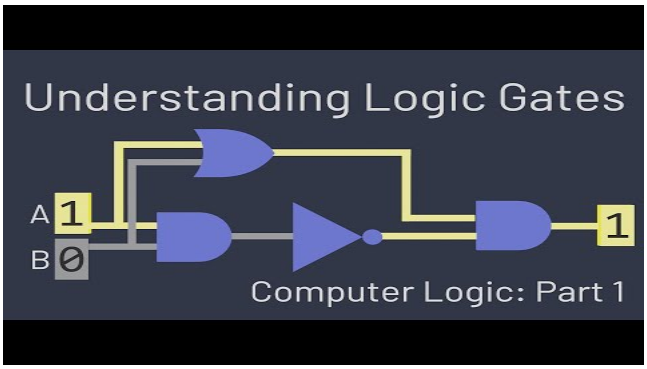
Input A	Input B	Output
0	0	0
1	0	0
0	1	0
1	1	1

C.

Input A	Input B	Output
0	0	0
1	0	1
0	1	1
1	1	1

4. Which truth table represents the logic gate that you are designing? * 1 point
Type your answer using an uppercase letter

Watch this video if you need more help understanding how truth tables relate to logic gates



http://youtube.com/watch?v=INEtYZqtjTo

5. Use your instructions and build your gate. Once you have built your gate and its outputs match your truth table click the "ready to move on" option below * 1 point

Mark only one oval.

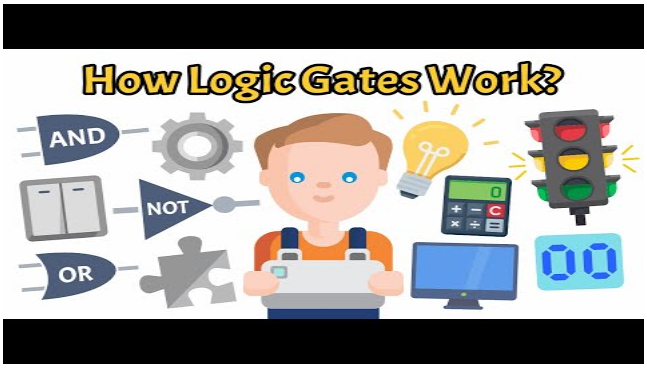
- Ready to move on *Skip to question 15*
- I can't get my gate to work. *Skip to question 3*

Skip to question 15

Accidental Triggering Prevention

6. The customer doesn't want the alarm system to accidentally be triggered by employees or customers during normal business hours. Your task is to create a logic gate that will eventually be integrated with the exterior breach sensor. You want the alarm system to be triggered when the exterior breach system is giving a high output and it is outside of business hours (a timing system giving a second high output). What kind of logic gate will you build? * 1 point
Type your answer using all uppercase letters

Watch this video if you need more help understanding logic gates



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1	0

B.

Input A	Input B	Output
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1	0	0
0	1	0
1	1	1

C.

Input A	Input B	Output
0	0	0
1	0	1
0	1	1
1	1	1

7. Which truth table represents the logic gate that you are designing? * 1 point
Type your answer using an uppercase letter

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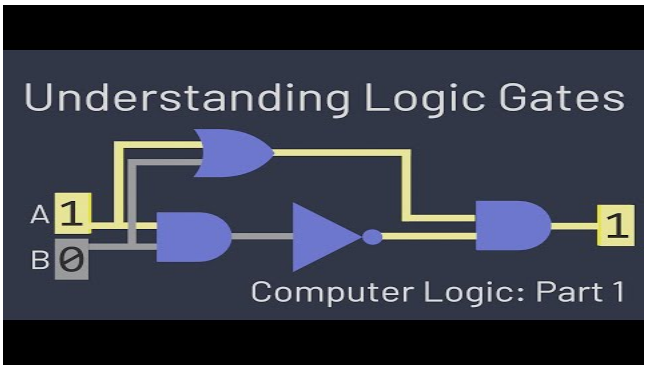


http://youtube.com/watch?v=INEtYZqtjTo

8. Use your instructions and build your gate. Once you have built your gate and its outputs match your truth table click the "ready to move on" option below * 1 point

Mark only one oval.

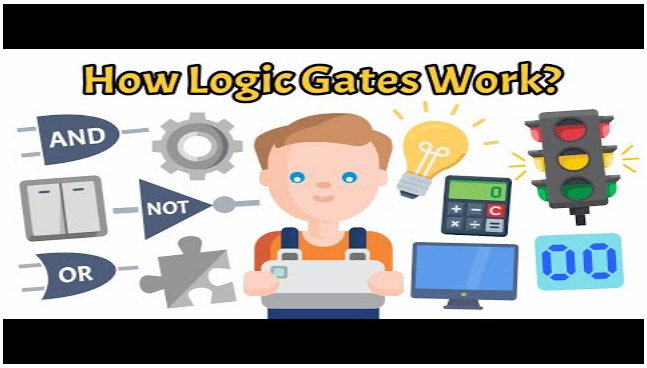
- Ready to move on
- I can't get my gate to work.

Skip to question 15

Disarming System Design

9. Your task is to create a gate that will be in a high state as long as the manual disarming code hasn't been entered. Entering the disarming code will close the circuit (high input) and will disarm the alarm (low output). Which kind of gate will you build? * 1 point
Type your answer using all uppercase letters

Watch this video if you need more help understanding logic gates



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A.

Input	Output
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1	0

B.

Input A	Input B	Output
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1	0	0
0	1	0
1	1	1

C.

Input A	Input B	Output
0	0	0
1	0	1
0	1	1
1	1	1

10. Which truth table represents the logic gate that you are designing? * 1 point
Type your answer using an uppercase letter

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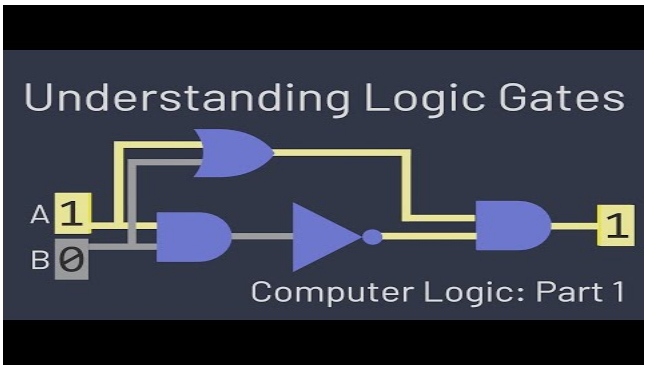

http://youtube.com/watch?v=INEtYZqtjTo

11. Use your instructions and build your gate. Once you have built your gate and its outputs match your truth table click the "ready to move on" option below * 1 point

Mark only one oval.

- ◯ Ready to move on
- ◯ I can't get my gate to work

Skip to question 15

Design Integration Specialist

12. Your task is to create a gate that will integrate the inputs from the accidental triggering prevention and the disarming system. Your gate needs to work when the accidental triggering prevention system is giving a high output and when the disarming system has not been engaged and is therefore giving a high output. However, if the disarming system has been engaged, and is giving a low output, your gate should not allow the alarm to operate. What type of gate will you build? **Type your answer using all uppercase letters** * 1 point

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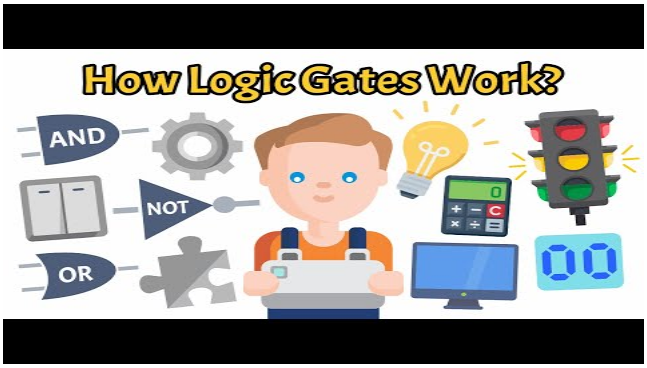

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TRUTH TABLES

A.

Input	Output
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1	0

B.

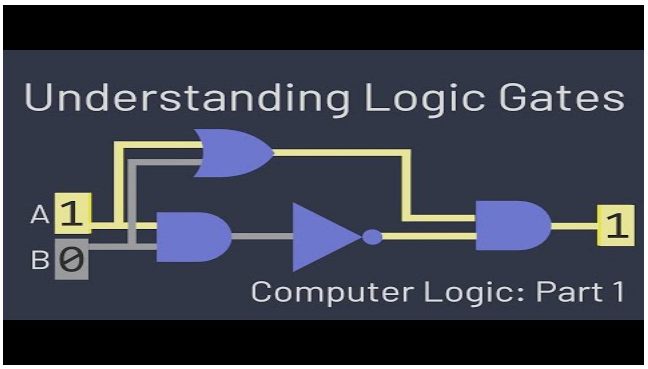
Input A	Input B	Output
0	0	0
1	0	0
0	1	0
1	1	1

C.

Input A	Input B	Output
0	0	0
1	0	1
0	1	1
1	1	1

13. Which truth table represents the logic gate that you are designing? * 1 point
Type your answer using an uppercase letter

Watch this video if you need more help understanding how truth tables relate to logic gates



http://youtube.com/watch?v=INEtYZqtjTo

14. Use your instructions and build your gate. Once you have built your gate and its outputs match your truth table click the "ready to move on" option below * 1 point

Mark only one oval.

- Ready to move on
- I can't get my gate to work

Skip to question 15

Final Design Integration

Here you will discuss with your teammates and use the information below to combine your logic gates into a final design for a security system that meets the business owner's needs.

15. Your smart alarm system should turn on when: * 1 point
-Either the door or window is breached
and
-It is outside business hours
-Not when the manual disarming code has been entered.

Create a diagram on your worksheet using Boolean logic symbols to show how you can combine your gates to solve the problem.

On your worksheet, create truth tables for each gate to indicate how the gates work together to meet the design requirements.

Wire your gates together to create your final product.

Then call your instructor over to check your work.