
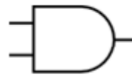





## KEY CONCEPTS:

It is useful to combine conditions for testing. Some examples of Logic gates and their truth tables:

Gate with Logic table	Notes																		
<p>NOT</p>  <table border="1"><thead><tr><th colspan="2">INPUT</th><th>OUTPUT</th></tr><tr><th>A</th><th></th><th></th></tr></thead><tbody><tr><td>0</td><td></td><td>1</td></tr><tr><td>1</td><td></td><td>0</td></tr></tbody></table>	INPUT		OUTPUT	A			0		1	1		0	Reverses the input or condition e.g. NOT equals						
INPUT		OUTPUT																	
A																			
0		1																	
1		0																	
<p>AND</p>  <table border="1"><thead><tr><th colspan="2">INPUT</th><th>OUTPUT</th></tr><tr><th>A</th><th>B</th><th></th></tr></thead><tbody><tr><td>0</td><td>0</td><td>0</td></tr><tr><td>1</td><td>0</td><td>0</td></tr><tr><td>0</td><td>1</td><td>0</td></tr><tr><td>1</td><td>1</td><td>1</td></tr></tbody></table>	INPUT		OUTPUT	A	B		0	0	0	1	0	0	0	1	0	1	1	1	Both conditions are true
INPUT		OUTPUT																	
A	B																		
0	0	0																	
1	0	0																	
0	1	0																	
1	1	1																	
<p>OR</p>  <table border="1"><thead><tr><th colspan="2">INPUT</th><th>OUTPUT</th></tr><tr><th>A</th><th>B</th><th></th></tr></thead><tbody><tr><td>0</td><td>0</td><td>0</td></tr><tr><td>1</td><td>0</td><td>1</td></tr><tr><td>0</td><td>1</td><td>1</td></tr><tr><td>1</td><td>1</td><td>1</td></tr></tbody></table>	INPUT		OUTPUT	A	B		0	0	0	1	0	1	0	1	1	1	1	1	Either condition is true
INPUT		OUTPUT																	
A	B																		
0	0	0																	
1	0	1																	
0	1	1																	
1	1	1																	

<p>XOR</p>  <table border="1" style="margin-top: 10px;"> <thead> <tr> <th colspan="2">INPUT</th> <th rowspan="2">OUTPUT</th> </tr> <tr> <th>A</th> <th>B</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>1</td> <td>0</td> <td>1</td> </tr> <tr> <td>0</td> <td>1</td> <td>1</td> </tr> <tr> <td>1</td> <td>1</td> <td>0</td> </tr> </tbody> </table>	INPUT		OUTPUT	A	B	0	0	0	1	0	1	0	1	1	1	1	0	<p>ONLY ONE of the conditions is true</p>
INPUT		OUTPUT																
A	B																	
0	0	0																
1	0	1																
0	1	1																
1	1	0																
<p>NAND</p>  <table border="1" style="margin-top: 10px;"> <thead> <tr> <th colspan="2">INPUT</th> <th rowspan="2">OUTPUT</th> </tr> <tr> <th>A</th> <th>B</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>0</td> <td>1</td> </tr> <tr> <td>1</td> <td>0</td> <td>1</td> </tr> <tr> <td>0</td> <td>1</td> <td>1</td> </tr> <tr> <td>1</td> <td>1</td> <td>0</td> </tr> </tbody> </table>	INPUT		OUTPUT	A	B	0	0	1	1	0	1	0	1	1	1	1	0	<p>One of the UNIVERSAL gates, from which all other logic combinations can be built.</p>
INPUT		OUTPUT																
A	B																	
0	0	1																
1	0	1																
0	1	1																
1	1	0																

1. We also created separate branches in code by testing a variable against multiple conditions using the `match...case` statement

The general format for the statement is as follows:

```

match variable:
    case condition1:
        Statements to execute
    case condition2:
        Other statements to execute
    .
    .
    .
    case _ :
        Statements if no conditions are matched

```

Things to pay attention to:

- a. There is a colon sign (:) after the `match` clause and each of the `case` clauses
- b. You need to insert a tab (or 4 spaces) to indent the statements that will be executed if the condition is true, and there are two tiers of indentation
- c. The last special case of `case _` : specifies where no conditions are met

## HOMEWORK:

1. Write out the logic gates for NOR and XNOR gates
2. Write a program using that asks the user for a numeric grade between 0 and 100, and converts it to a letter grade using the table below:

91 - 100: A  
81 - 90 : B  
71 - 80 : C  
61 - 70 : D  
60 or less: F

Use `if..elif..else` statements to complete the assignment.

HINT: use the `input()` function to ask the user for input and use the `int()` function to make sure the user input is treated as in integer

3. Write a program that asks the user for the kind of pet (dog, cat, parrot, etc) they have and suggest a name for their pet using the `match...case` statement