# Exercise 15: Memorizing Logic

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Welcome to another lecture on Python programming language. You will be glad to know that you've completed a lot in python in the previous exercises: from taking input from the users, playing with variables to handling files and creating your own functions. Now, we will look at creating the logic out of your programs.

The logic creation will require the notion of True and False so that you can create your own logical rules. For eg. if-then relationship like "if x is an even integer, then x is divisible by 2". In programming languages, it is very important to build up the right logic for the work that you want to carry out using your programs. Of course, you want some productive work to be done by your program when you become comfortable with your programming skills. For eg. creating an algorithm in CPSS or finding the edge of an image in LIPS.

All of these algorithms have a architectural logic associated with them which produces the right result after the program runs. Therefore, logic is the foundation of computer science, hence very important for a programmer to get it right.

THE TRUTH TERMS

In Python we have the following terms (characters and phrases) for determining if something is “True” or “False.” Logic on a computer is all about seeing if some combination of these characters and some variables is True at that point in the program.

• and
• or
• not
• != (not equal)
• == (equal)
• >= (greater-than-equal)
• <= (less-than-equal)
• True
• False

We understand logic primarily in the form of truth tables. There are certain easy to understand truth tables given below. They are written as Python understands them. You can also type in the left hand side of the table and see the results for yourself. Make sure you learn these tables by heart because these are the foundations of any program in any programming language.

| NOT | True? |
|---|---|
| not False | TRUE |
| not True | FALSE |

| AND | True? |
|---|---|
| True and False | FALSE |
| True and True | TRUE |
| False and True | FALSE |
| False and False | FALSE |

| OR | True? |
|---|---|
| True or False | TRUE |
| True or True | TRUE |
| False or True | TRUE |
| False or False | FALSE |

| NOT OR | True? |
|---|---|
| Not(True or False) | FALSE |
| Not(True or True) | FALSE |
| Not(False or True) | FALSE |
| Not(False or False) | TRUE |

| NOT AND | True? |
|---|---|
| Not(True and False) | TRUE |
| Not(True and True) | FALSE |
| Not(False and True) | TRUE |
| Not(False and False) | TRUE |

| != | True? |
|---|---|
| 1 != 0 | TRUE |
| 1 != 1 | FALSE |
| 0 != 1 | TRUE |
| 0 != 0 | FALSE |

| "==" | True? |
|---|---|
| 1 == 0 | FALSE |
| 1 == 1 | TRUE |
| 0 == 1 | FALSE |
| 0 == 0 | TRUE |