

Assignment #4

Boolean operators and conditions in python



Useful computer programs commonly make simple **comparisons** to help make decisions. **Boolean logic** is a form of comparison where all values are either **True** or **False**. The simplest form is the **if statement**:

```
if x % 2 == 0:
    print(x, " is even.")
else:
    print(x, " is odd.")
```

Only one condition here:
(if the remainder of division by 2
is equal to 0) TRUE or FALSE

When solving problems, computer programs often need to test **more than one condition** at a time.

Example:

If a driver's age is greater than 16 **AND** less than 95 they should be capable of driving.

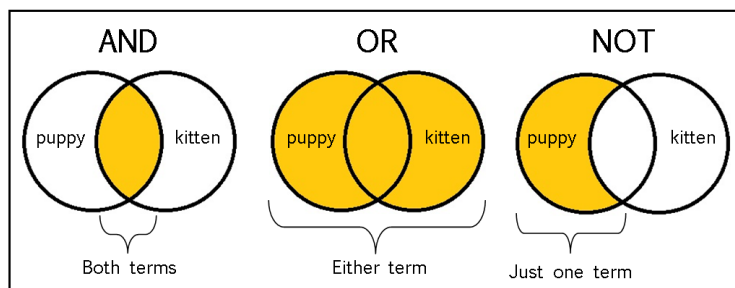


$16 < \text{age}$ **AND** $\text{age} < 95$



Testing **multiple condition** at once is very common in computer programming and is can be done easily with **Boolean operators**

Generally, we have 3 **Boolean operators** to work with when combining conditions:



Let's take a look at some examples of each operator...**Put the following code into Trinket and test them out.**

the **AND** operator:

Let's say you have to write **2 separate** tests in computer programming and If **both** test's score is greater than or equal to 50%, then you pass the course.

We could use the AND operator to test **both** conditions.

```
score1 = int(input("What did you score in test 1?"))
score2 = int(input("What did you score in test 2?"))
```

```
if score1 >= 5 and score2 >= 5:
```

```
    print("You have passed!")
```

Put this code into Trinket!

```
else:
```

```
    print("Sorry, you didn't pass but on the bright side you get to take computer programming again!")
```

OR operator:

Now imagine you had an easier computer programming teacher...and they said all you needed to do to pass the course was to score higher than 50% on **either** one test **OR** the other...you could use the following program:

```
score1 = int(input("What did you score in test 1?"))
score2 = int(input("What did you score in test 2?"))
if score1 >= 50 or score2 >= 50:
    print("You have passed!")
else: print("You couldn't pass even one test?...lame.")
```

Put this code into Trinket!

**Boolean
Operators:**

AND OR NOT

NOT operator:

The NOT operator is commonly used to **exclude** things. For example: Let's say you want to make sure that **bananas** or **pickles don't** end up in your lunch. You could write the following code for your **lunch box's display screen**:

```
lunch=str(input("Yo mom, whud ya put in my lunch?"))
```

```
if not (lunch=="banana" or lunch=="pickles"):
```

```
    print ("Thanks mom!")
```

```
else:
```

```
    print ("Lame!")
```

Put this code into Trinket!



!=

(also another way of saying "NOT equal to")

Example: (type into Trinket)

```
lunch=str(input("Yo mom, whud ya put in my lunch?"))
```

```
if (lunch!='banana' and lunch!='pickles'):
```

```
    print ("Thanks mom!")
```

```
else:
```

```
    print ("Lame!")
```

Put this code into Trinket!

Notice: as we changed the position of our NOT operator to inside the brackets, the OR was change to an AND from the previous example...tricky, but it makes perfect sense when you look at it closely.

Exercise#1

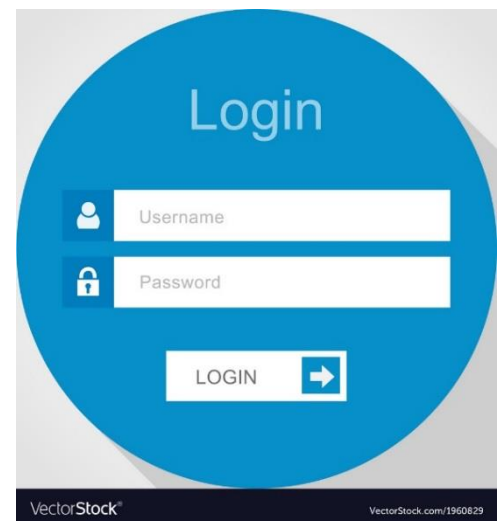
Checked Baggage Exercise

Create a program in Python that does the following:

1. Prompt the user for the number of bags they have with them
2. Prompt the user and ask them if they have any bags over 50 kg (yes/no)
3. Using a single if statement, print out whether or not they can check their bags (**if they have more than zero bags AND no bags over 50 kg**)

Exercise#2

- Write a program that asks a user for a username and a password.
- Check to see if BOTH the username and password are correct.
- If so, provide a Welcome message to the user.
- If not, provide a Login Failure message to the user.



Exercise#3

Hot Chocolate Exercise:

Create a program in Python that does the following:

1. Prompt the user to see how much time they have before class (in minutes).
 2. Prompt the user to see how much money they have (in dollars)
 3. Prompt the user to see if it is raining (yes/no)
 4. Prompt the user to see if they have a rain coat or umbrella (yes/no)
3. Trying using as few if-else statements as possible, to print out whether or not they should go get a hot chocolate before class starts.

They should go *only* get a hot chocolate if they have:

- a) More than 15 minutes before class AND
- b) They have at least 3 dollars
- c) AND it is either not raining OR if it is raining, they have a raincoat or umbrella.

If you need more than one if statement (that's OK)...**bonus** if you can make it work with one!

Exercise#4

1. Prompt the user for their number grade (0-100)
2. Use a series of if-statements and Boolean operators to print out their letter grade
According to the following chart

95 - 100%	A+
90 - 94%	A
85 - 89%	A-
80 - 84%	B+
75 - 79%	B
70 - 74%	B-
65 - 69%	C+
60 - 64%	C
55 - 59%	C-
50 - 54%	D+
45 - 49%	D
40 - 44%	D-
<40%	F

Exercise#4

Predict the results of the following code. Each “print” line will output TRUE or FALSE. Predict TRUE or FALSE for each print line. Then put the code into Trinket to see the results.

Code#1

```
a = 5
b = 10
print (a > b and a > 1)
print (a > 1 and b > a)
print (a == 5 and b < 100)
print (a > 1 and b < 1 and b > a)
print (a > 1 and b > 1 and b > a)
```

Code#2

```
a = 5
b = 10
print (a > b or a > 1)
print (a > 1 or b > a)
print (a == 5 or b < 100)
```

```
print (a > 1 or b < 1 or b > a)
print (a > 1 or b > 1 or b > a)
```

Exercise#5

Write a python program that does the following:

- Ask the user to guess a number between 1 and 10. Assume they will enter an Integer.
- Store a random number using the between 1 and 10 that is your “secret” number

Example:

```
import random
secret=(random.randint(0,9))
```

- If the user types in your secret number, tell them that they win!
- If the user types in a number less than or greater than your secret number, tell them that they’re either above or below the number and to try again.