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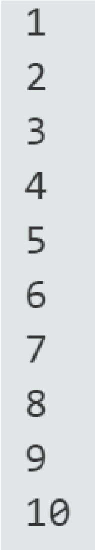
Python Lesson 5

Boolean Logic

Review: While Loops

```
counter = 0
while counter < 10:
    counter = counter + 1
    print(counter)
```



```
1
2
3
4
5
6
7
8
9
10
```

Logical Operators: Introduction

- If it’s raining **and** you are going outside, you should take an umbrella.
- If it’s Saturday **or** Sunday, you don’t have school.
- If it’s **not** your birthday, your age stays the same.
- Python lets you use **and**, **or**, and **not** to combine conditional statements and use more complicated logic in your code.

Logic Operators: Truth Table

a	b	a and b
True	True	True
True	False	False
False	True	False
False	False	False

a	b	a or b
True	True	True
True	False	True
False	True	True
False	False	False

a	not a
True	False
False	True

Logic Operators: Activity

- What does the following code output?

```
x = 5
print(x == 5 and x == 2)        False
print(x == 5 and x != 2)        True
print(x == 5 or x == 2)         True
print(x == 5 or x != 2)         True
print(not x == 5)               False
print(not x == 2)               True
```

What does this code do?

```
x = int(input(“Enter a number: ”))
if x > 0:
    print(x, “is positive”)
else:
    print(x, “is not positive”)
```

```
Enter a number: 5
5 is positive
```

```
Enter a number: -4
-4 is not positive
```

```
Enter a number: 0
0 is not positive
```

Conditionals: Elif Statements

if *boolean expression*:

    statements

elif *boolean expression*:

    statements

else:

    statements

Example:

```
x = int(input(“Enter a number: ”))
if x > 0:
    print(x, “is positive”)
elif x < 0:
    print(x, “is negative”)
else:

    print(x, “is zero”)
```

```
Enter a number: 5          Enter a number: -4
5 is positive              -4 is negative


          Enter a number: 0
          0 is zero
```

Anatomy of Elif Statements

```
x = i                       a number: ")
if x
    p                  is po       ve")
elif x < 0:
    print(x, "is negative")
else:
     rint(x, "is 0")
```

elif tells the program you want to evaluate the 2nd condition if the 1st condition is False.

A condition that evaluates to either True or False.

: tells the program you are starting the statements block.

The statements get executed if the 2nd condition is True.

The statements must all be indented the same amount.

else tells the program you want to execute the statements if both the 1st and the 2nd conditions are False.

Conditionals: Practice

What does the following code output?

```
x = 10
y = 20
if(x < 5 or x > y):
    print(“Woohoo!”)
elif(x < 20 and y > x):
    print(“Yay!”)
elif(not y == 30):
    print(“Eureka!”)
else:
    print(“Doh!”)
```

```
Yay!
```

Conditionals: Practice

What does the following code output?

```
x = 30
y = 20
if(x < 5 or x > y):
    print(“Woohoo!”)
elif(x < 20 and y > x):
    print(“Yay!”)
elif(not y == 30):
    print(“Eureka!”)
else:
    print(“Doh!”)
```

```
Woohoo!
```

Conditionals: Practice

What does the following code output?

```
x = 30
y = 40
if(x < 5 or x > y):
    print(“Woohoo!”)
elif(x < 20 and y > x):
    print(“Yay!”)
elif(not y == 30):
    print(“Eureka!”)
else:
    print(“Doh!”)
```

```
Eureka!
```

Conditionals: Practice

What does the following code output?

```
x = 30
y = 30
if(x < 5 or x > y):
    print(“Woohoo!”)
elif(x < 20 and y > x):
    print(“Yay!”)
elif(not y == 30):
    print(“Eureka!”)
else:
    print(“Doh!”)
```

```
Doh!
```

Recap

- Logical operators: and, or, not
- To write conditional statements,

```
if boolean expression:
    statements
elif boolean expression:
    statements
else:
    statements
```