Booleans and If Statements: Takeaways

Syntax

COMPARISON OPERATORS

- `==` returns:
  - `True` if both values are equivalent: `5 == 5`
  - `False` if they're different: `5 == 6`
- `!=` returns:
  - `True` if both values are different: `5 != 6`
  - `False` if they're equivalent: `5 != 5`
- `>` returns:
  - `True` if the first value is greater than the second value: `5 > 1`
  - `False` if the first value is less than the second value: `5 > 6`
- `<` returns:
  - `True` if the first value is less than the second value: `5 < 6`
  - `False` if the first value is greater than the second value: `5 < 1`
- `>=` returns:
  - `True` if the first value is greater than or equal to the second value: `1 >= 1`
  - `False` if the first value is less than the second value: `1 >= 3`
- `<=` returns:
  - `True` if the first value is less than or equal to the second value: `1<=2`
  - `False` if the first value is greater than the second value: `1 <= 0`

IF STATEMENTS

- Basic if statement syntax:

```
python
sample_rate = 749
if sample_rate > 750:
    print("Higher than 750")
```

- Nested if statements:

```
python
sample_rate = 749
if sample_rate > 750:
    if sample_rate < 748:
        print("Higher than 750 AND lower than 748")
```

- If statement within a for loop:

```
python
sample_list = [0,1,2]
which_index = 0
for s in sample_list:
    if s == 2:
        which_index = counter
    counter += 1
```

Concepts

- We can use conditional logic to add criteria to the code we write. Some examples of operations that use criteria include:
    - Finding all the *integers* in a *list* that are greater than `5`.
    - Identifying which elements in a *list* are *strings*, and printing only those values.
- Python has a class called **Boolean** that helps express conditional logic. There are only two *Boolean* values: True and False. Because they're words, *Boolean* values may look like *strings*, but they're an entirely separate class.

- To complement *Booleans*, Python contains the *if* operator. We can use this operator to write a statement that tests whether certain conditions exist. Our *if* statement will evaluate to either True or False, and only run the specified code when True.
- Similar to *for* loops, we need to format *if* statements in the following way:
    - End the conditional statement with a colon (`:`)
    - Indent the code (that we want run when True) below the conditional statement
    - Also similar to *for* loops, *if* statements can contain multiple lines in the body, as long as their indentation aligns.

Resources

- Python Documentation: Comparison Operators
- Python Documentation: If Statements