Web Application Development using Python

Introduction to Flow Control
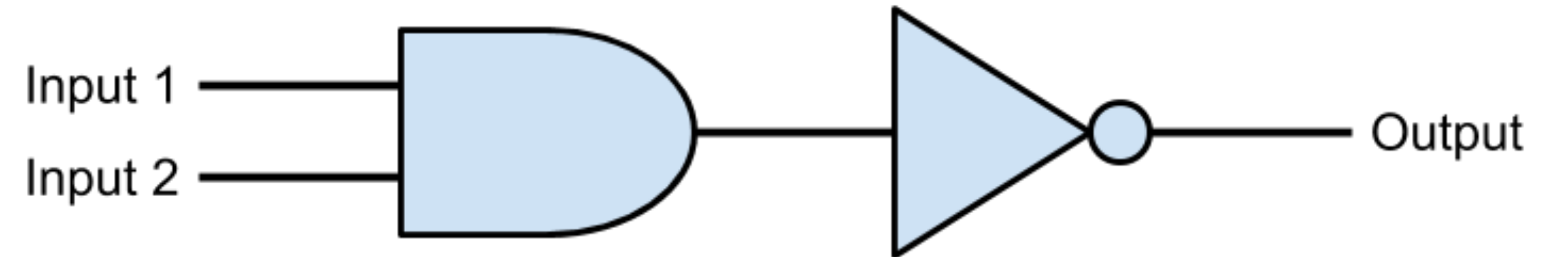
Prepared by George Khoury

Outline

- Comparison Operators

- Logical Operators

- Decisions - `if` statements

- Loops

  - `for`

  - `while`

- `range()`

Logic and Comparison

Input 1
Input 2
Output

Comparison Operators
W1/S3/ex0.py

Operator	Meaning	Example
>	Greater than	x > y
<	Less than	x < y
==	Equal to	x == y
!=	Not equal to	x != y
>=	Greater than or equal to	x >= y
<=	Less than or equal to	x <= y

Logical Operators
W1/S3/ex0.py

Operator	Meaning	Example
and	True if both operands are true	x **and** y
or	True if either of operands is true	x **or** y
not	True if operand is false	**not** x

Flow Control

While Loop Flow of Control

Is condition true?

No

Yes
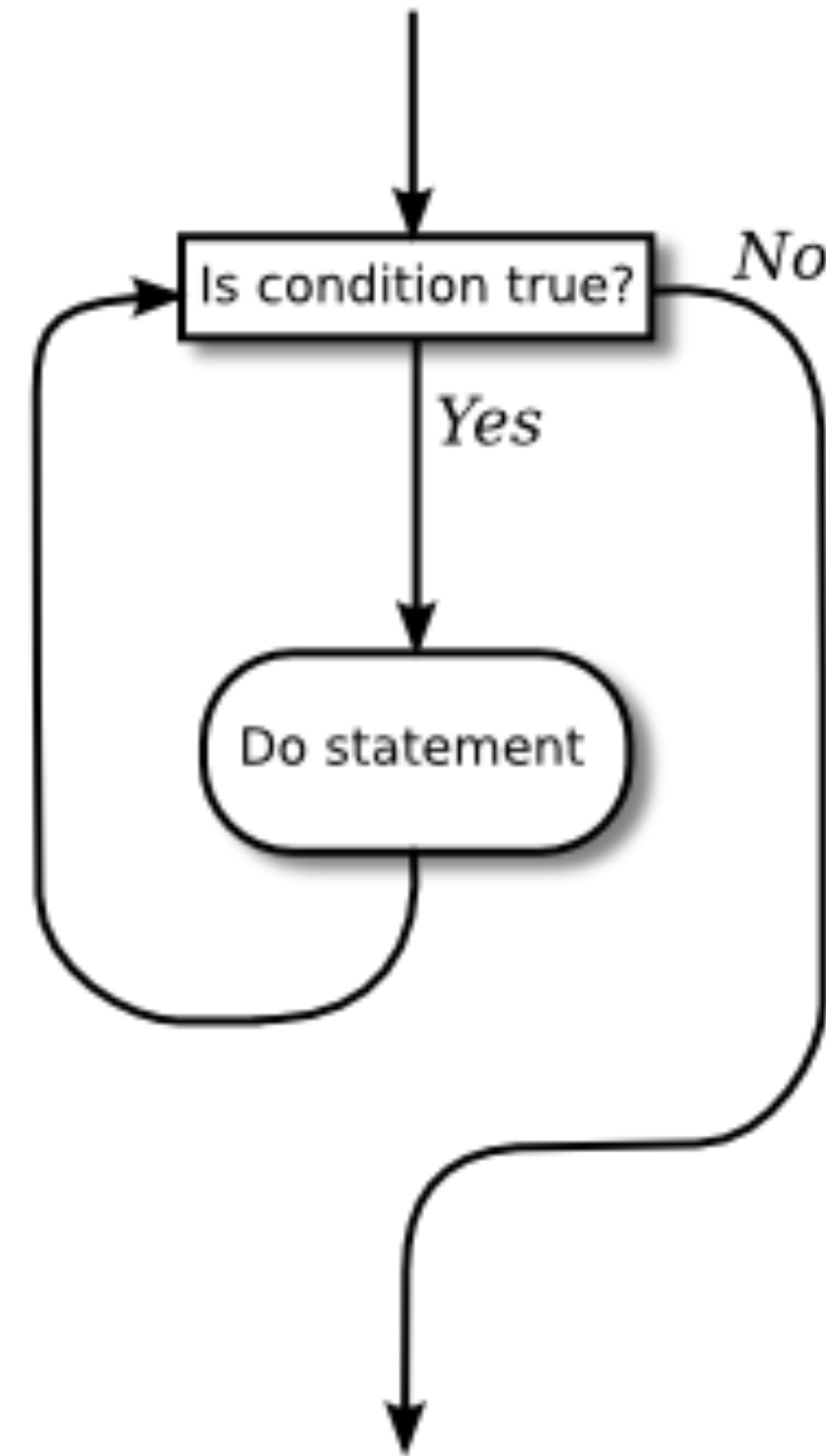
Do statement

If Statement Flow of Control

Is condition true?

No

Yes
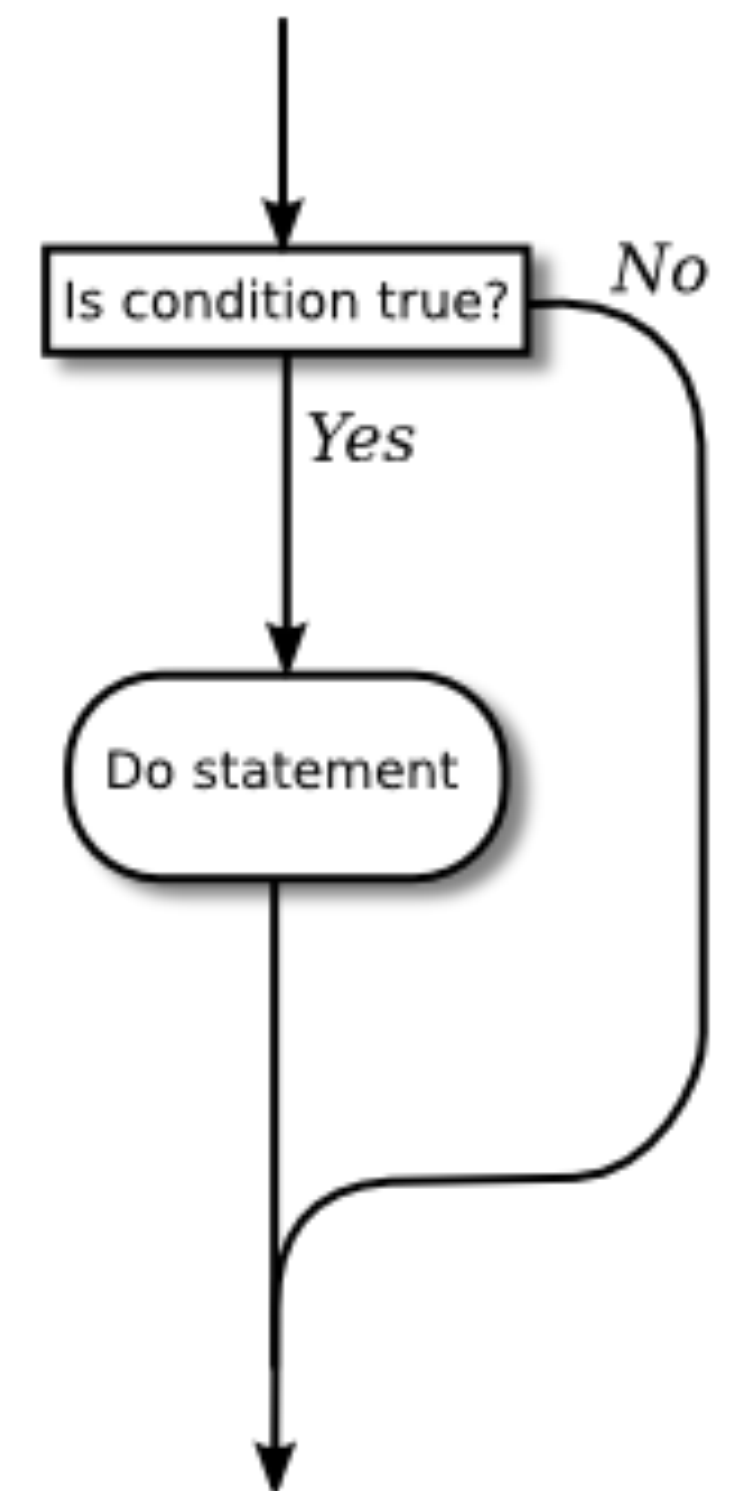
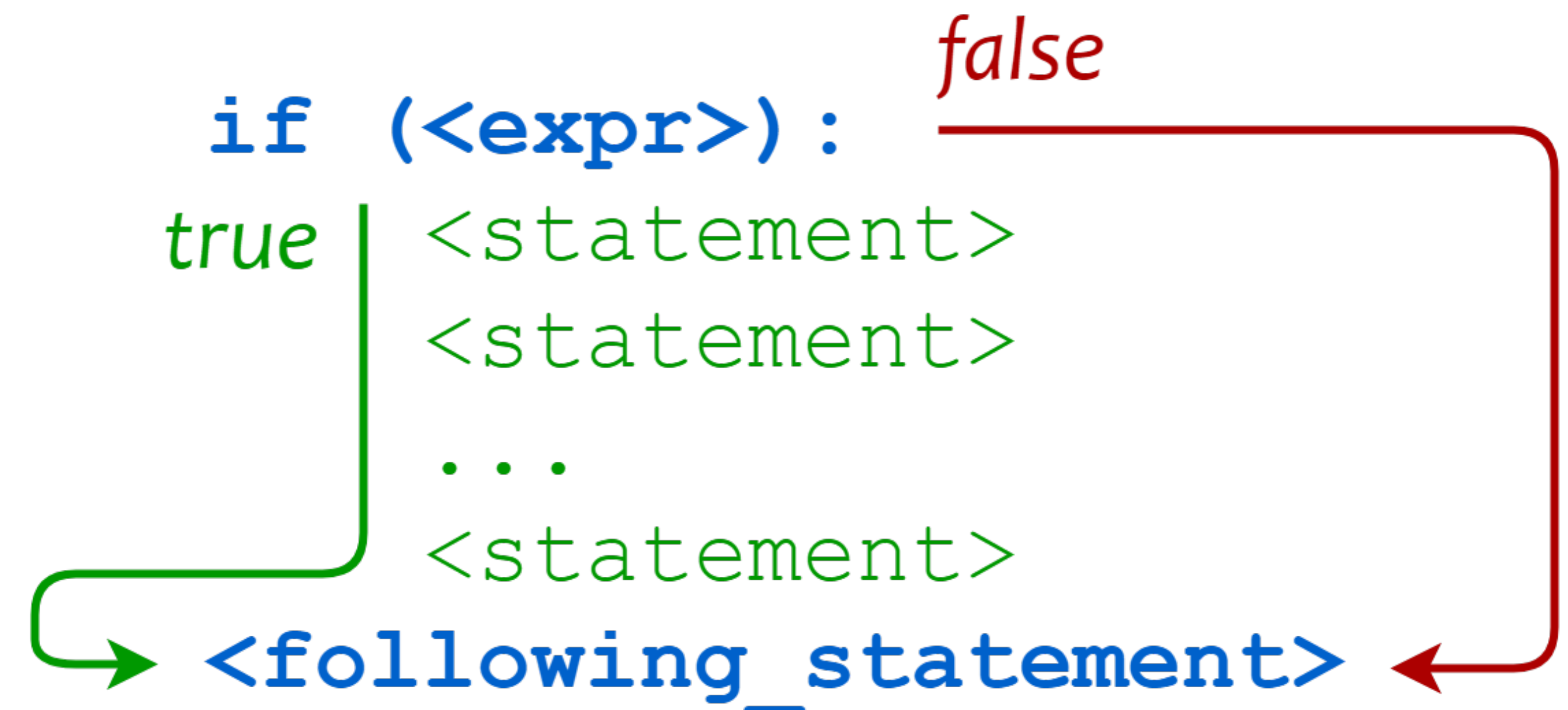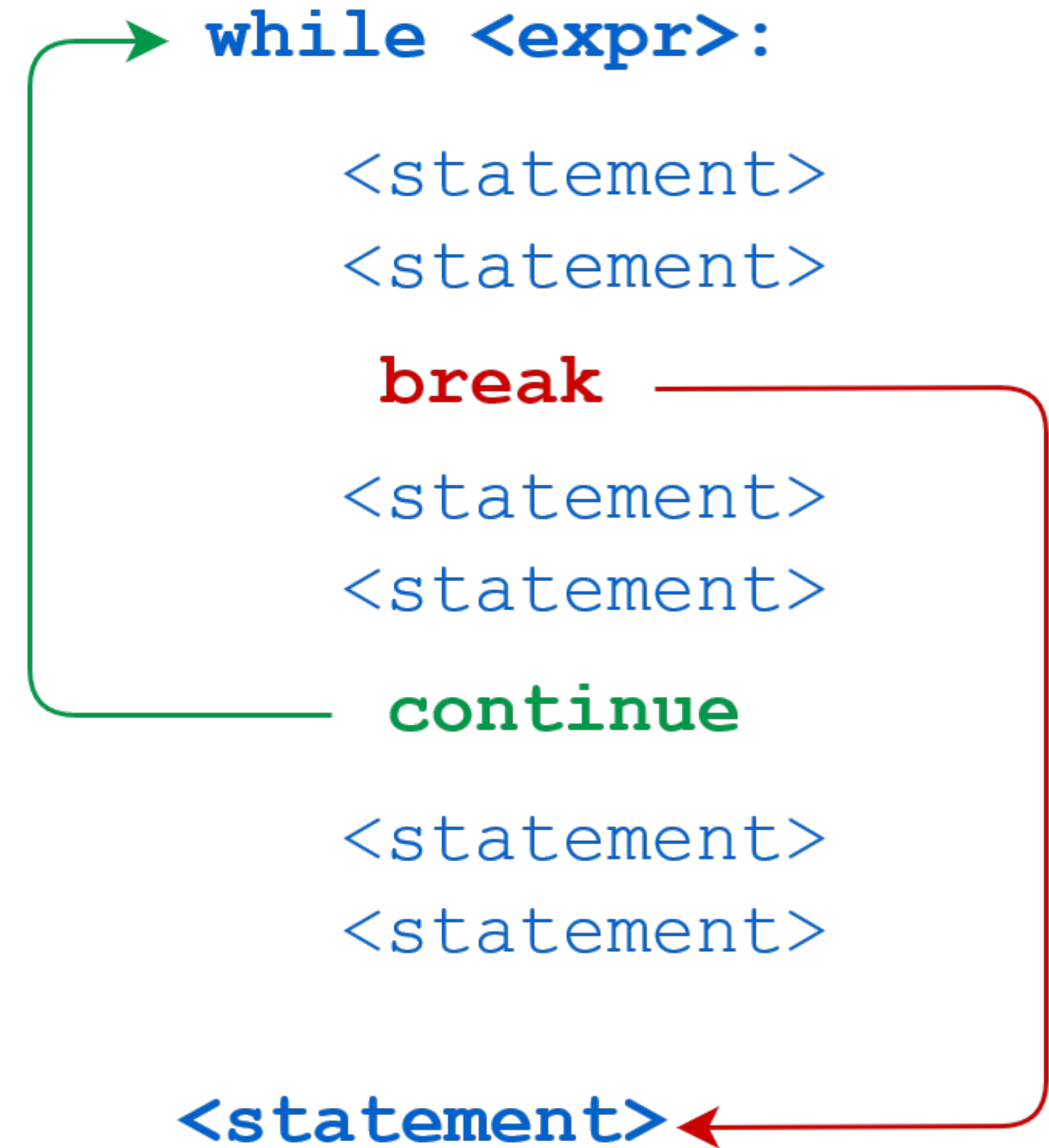Do statement

Decisions
W1/S3/ex1.py

- Decisions are an important part of flow control.

- Decisions allow us to execute certain blocks of code when a particular condition is met.

- In Python we use `if` statements to make decisions.

- **Indentation for the `if` block is very crucial in Python.**

```
if (<expr>):          false
    <statement>
    <statement>
    ...
    <statement>
<following_statement>
```

true

Loops
W1/S3/ex2.py

- Many Python objects are "iterable".

  - Which ones did we learn so far?

- Loops allow us to execute certain blocks of code over a controlled number of iterations.

- **Indentation for the** `for` **or** `while` **block is very crucial in Python.**

```python
while <expr>:
    <statement>
    <statement>
    break
    <statement>
    <statement>
    continue
    <statement>
    <statement>
<statement>
```

range()
W1/S3/ex3.py

- If you need to iterate over a sequence of numbers, the `range()` function can help you generate arithmetic progressions.

- The upper bound is never part of the generated sequence

  - `range(10)` generates 10 values, the legal indices for items of a sequence of length 10.

$$a_n = a_1 + (n - 1)d$$

n^{th} term in the sequence

1st term in the sequence

number of terms in the sequence

common difference

Resources

- https://docs.python.org/3/tutorial/controlflow.html
- https://docs.python.org/3/tutorial/controlflow.html#if-statements
- https://docs.python.org/3/tutorial/controlflow.html#for-statements
- https://docs.python.org/3/tutorial/controlflow.html#the-range-function
- https://docs.python.org/3/tutorial/controlflow.html#break-and-continue-statements-and-else-clauses-on-loops