Loops

For and While Loop

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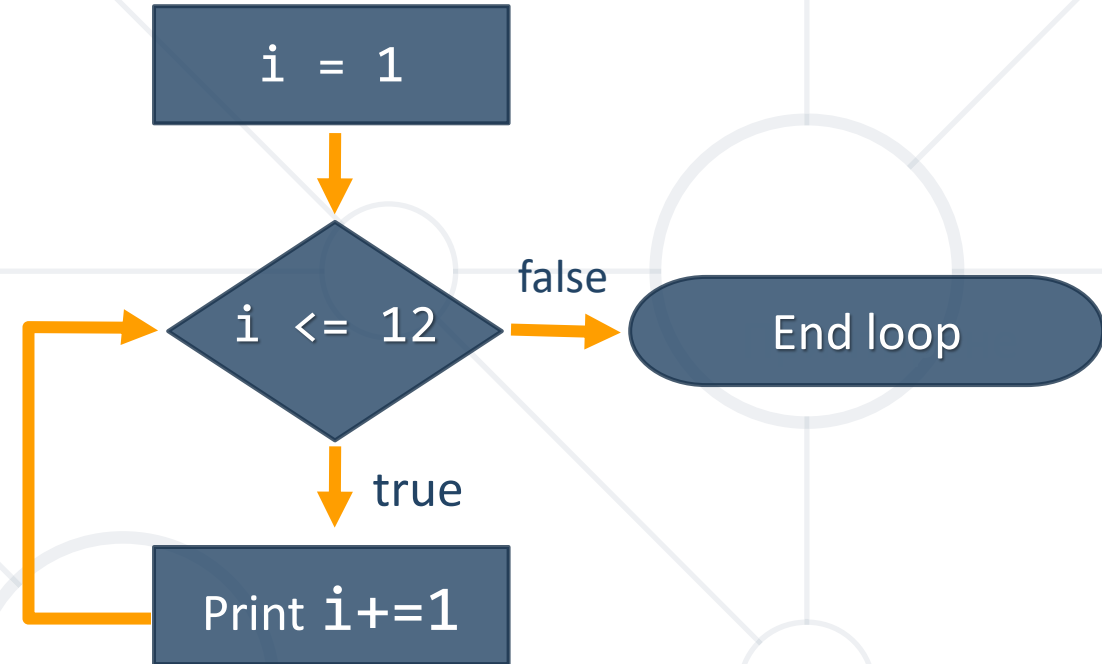# Repetition of Blocks of Code

What is a Loop?

- We often need to **repeat** the same action **multiple times**
- When we graduate we count to 12

What is a Loop?

- Loops in programming allow us to repeat **the same actions** a specific number of times:

```python
for i in range(1, 13):
    print(i)
```


i = 1

i <= 12 — false → End loop

true

Print i+=1

For Loop

- A **for** loop is used to **repeat a block of code multiple times**

- The for loop does not require an **indexing variable** to set beforehand

```python
for i in range(1, 11):
    print("Hello, world")
```

The `range()` Function

- To loop through a set of code a specified number of times, we can use the **range()** function

```
for x in range(3):
    print(x)
# 0

# 1

# 2
```

The break Statement

- The **break** statement **stops** the loop before it has looped through all the items

```python
for x in range(3):
    if x == 1:
        break
print(x)
```

→ 0

The continue Statement

- The **continue** statement **skips** the current iteration of the loop and continues with the next

```python
for x in range(3):
    if x == 1:
        continue
    print(x)
```

➡

```
0
2
```

The else Clause

- The **else** clause is executed when the loop finishes iterating without hitting the **break** statement

```
for x in range(3):
    if x == 3:
        break
else:
    print("Finish")
```
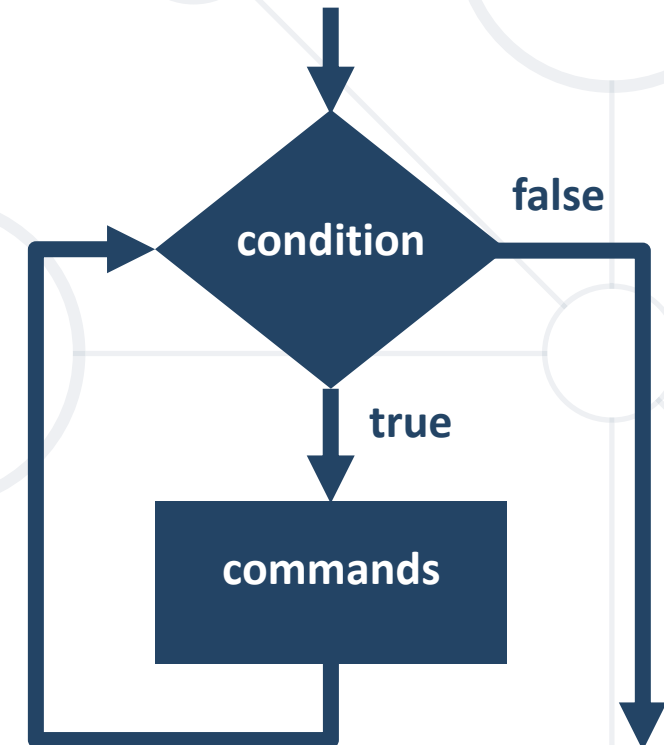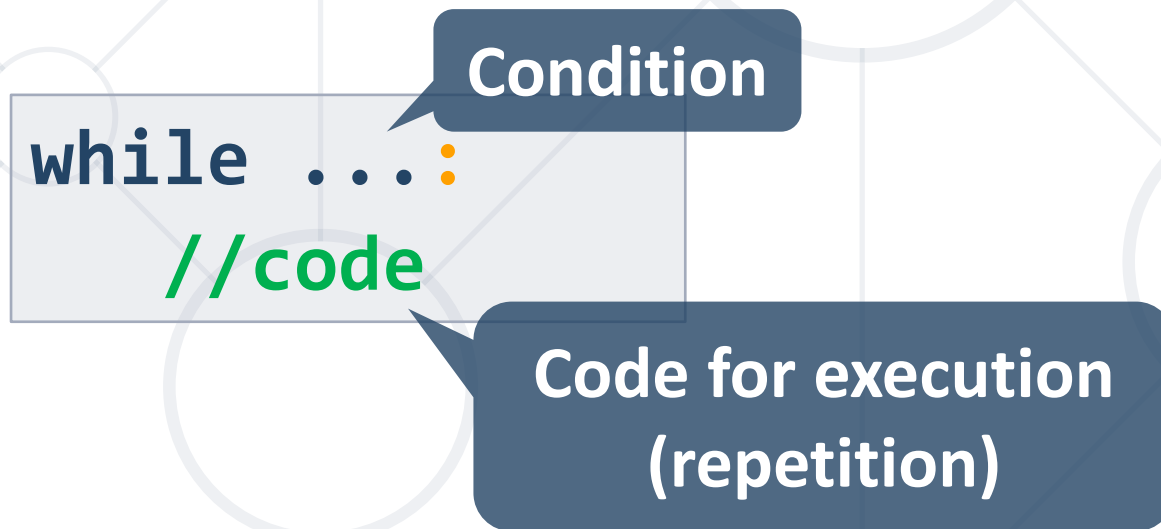
➡ Finish

While Loop

Construction

- As we already mentioned, in programming, we often need to execute a block of commands **multiple** times
  - We use **loops** for that purpose – `while`, `for` etc.

Condition
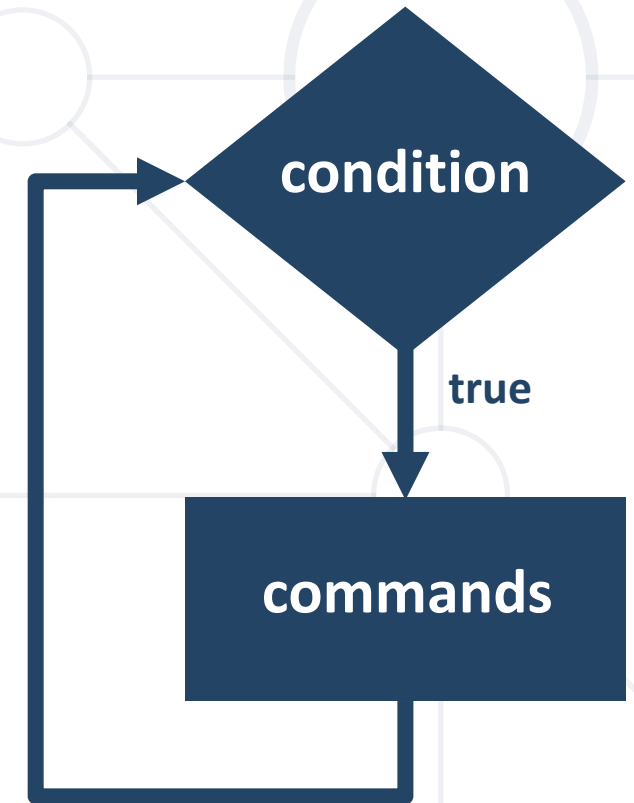
```
while ...:
    //code
```

Code for execution (repetition)

condition

false

true

commands

Example

```python
a = 5
while True:
    if a > 10:
        break
    print(a)
    a += 1
```

Break condition

Infinite Loop

- **Infinite Loop** – repeating a block of code an infinite number of times:

The condition is always true

```python
while True:
    print("Infinite loop")
```

condition

true

commands

Summary

- What is a **Loop**?

- **For** Loop

- **While** Loop

- **Breaking** a Loop

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