Control

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Control

A *Control* statement instrument the Python robot to take action based on a certain condition.

- Conditional Branch
  - if else
  - if elif else
  - match case
- Loop
  - while
  - for

if-else / if-elif-else

Some examples of conditional braching:

- If I am hungry, I will eat, otherwise I will play.
- If your age is above 6, you want coffee, otherwise you want milk.
- If your dad is angry, you shut up, otherwise keep whining.

if-else / if-elif-else

Some examples of conditional braching:

- If your age is above 6, you want coffee, otherwise you want milk.

What is the pattern?

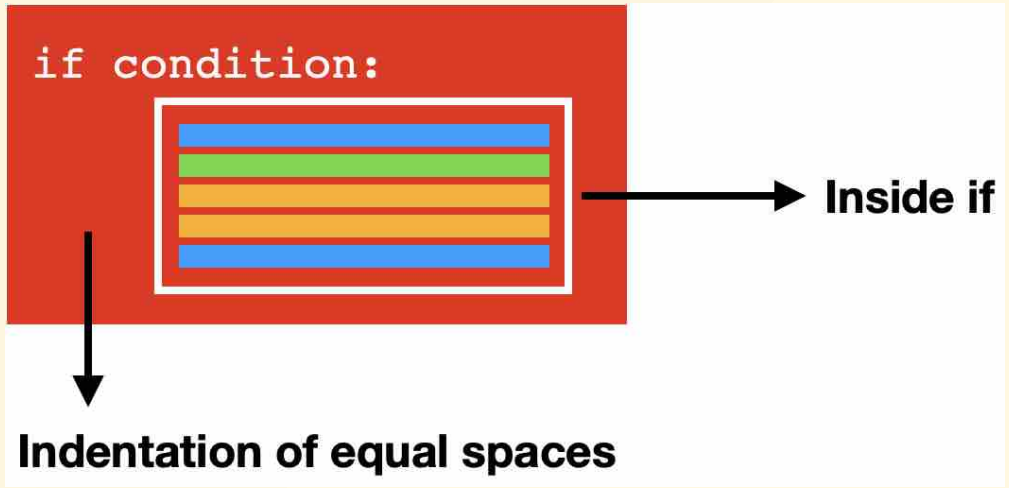
```
if cond:
    #take action when the cond can be satisified (i.e., cond is true)
else:
    #take action when the cond cannot be satisified (i.e., cond is false)
```

if-else

```
if cond:
    #take action when the cond can be satisified (i.e., cond is true)
else:
    #take action when the cond cannot be satisified (i.e., cond is false)
```

Love it or Hate it: now you need to know Python indentation.

Watch out, the Python indentation is coming!



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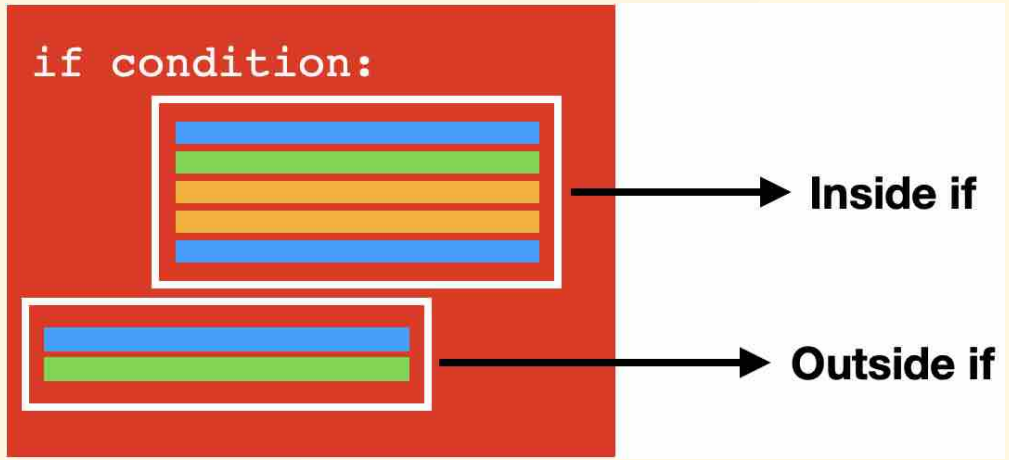

if-else / if-elif-else

Alright, a quiz, some elements are given below.

- Take an input from the terminal, asking for your age
- If your age is above 6, say `I can offer you coffee.`
- Otherwise, say `Kiddo, I can only offer milk.`

```
age = input("Let me know your age:")
age = int(age)
print("I can offer you coffee.")
print("Kiddo, I can only offer you milk.")
```

if-else / if-elif-else

```
age = input("Let me know your age:")
age = int(age)
if age > 6:
    print("I can offer you coffee.")
else:
    print("Kiddo, I can only offer you milk.")
```

if-else / if-elif-else

```
age = input("Let me know your age:")
age = int(age)
if age > 6:
    print("I can offer you coffee.")
    print("Do you feel the bitter?")
else:
    print("Kiddo, I can only offer you milk.")
    print("Do not forget to say thank you.")
    print("You are welcome!")
```

if-else / if-elif-else

Alright, another quiz, some elements are given below.

- Take an input from the terminal, asking for your age
- If the age is smaller than 6, say `Kiddo, I can only offer milk.`
- If your age is >= 6 but smaller than 18 , say `I can offer you coffee.`
- If your age is >= 18 but smaller than 18 , say `I can offer you wine.`

Solution 1

```
age = input("Let me know your age:")
age = int(age)
if age < 6:
    print("I can offer you milk.")

if age >= 6 and age < 18:
    print("I can offer you coffee.")

if age >= 18:
    print("I can offer you wine.")
```

Solution 2

```
age = input("Let me know your age:")
age = int(age)
if age < 6:
    print("I can offer you milk.")
elif age < 18:
    print("I can offer you coffee.")
else:
    print("I can offer you wine.")
```

Benefits: more efficient, more concise, more coherent.

Loop

- while
  - this is going to be our focus
- for

while

```
while cond:
    #action
```

Repeatedly execute the `action` when `cond` is true.

while

Example: print 1, 2, 3, ... 1000

How can you do it?

```
print(1)
print(2)
...
print(1000)
```

while

Example: print 1, 2, 3, ... 1000

```
i = 1
while i <= 999:
    print(i)
    i = i + 1
```

while

Example: print 1000, 999, ... 1

```
i = 1000
while i >= 2:
    print(i)
    i = i - 1
```

while

Quiz 1: print 10, 11, 12, ... 20

while

Quiz 2: print 2, 4, 6, ... 100

while

Quiz 3: print a number between 1 and 100 if it is divisible by 3.

Hint: `%` is an arithmetic operation to get the remainder of a division.

Example:

- 3 % 3 is 0,
- 9 % 3 is 0,
- 10 % 3 is 1.

while

Quiz 4: decide whether a number is a prime number.

while

Quiz 5: given two integers, adding all integers from the first one to the second one.

For example

- num1 = 2
- num2 = 10
- return 2 + 3 + 4 + ... 10

while

Quiz 6: given two integers, adding all integers from the first one to the second one.

For example

- num1 = 10
- num2 = 2
- return 10 + 9 + 8 + ... + 2