

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?

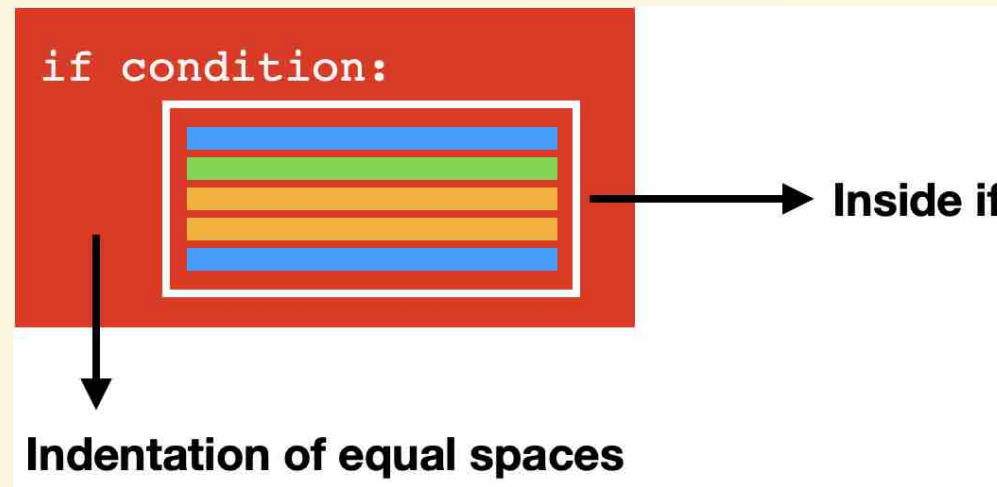
```
if cond:  
    #take action when the cond can be satisfied (i.e., cond is true)  
else:  
    #take action when the cond cannot be satisfied (i.e., cond is false)
```

if-else

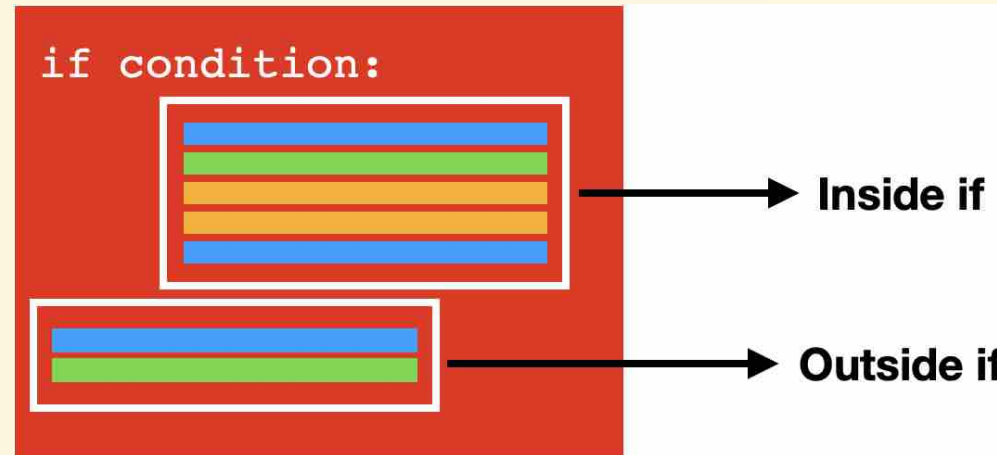
```
if cond:  
    #take action when the cond can be satisfied (i.e., cond is true)  
else:  
    #take action when the cond cannot be satisfied (i.e., cond is false)
```

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

Watch out, the Python indentation is coming!



Watch out, the Python indentation is coming!



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.