Programming Thinking

Session 4

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Plan for today

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Boolean operators

operators to produce or combine **bool** values

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Conditional execution

to make our programs branch

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Boolean operators

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Conditional execution

to make our programs branch

Functions

for not repeating ourselves ;)

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Boolean operations

We're going to learn two kinds of operators that operate on **bool** values:

- comparision operators
- logical operators

Boolean operations are useful for conditional execution.

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Comparision operators

name	description
`x == y`	x is **equal to** y
`x != y`	x is **not equal to** y
`x > y`	x is **greater than** y
`x < y`	x is **lesser than** y
`x >= y`	x is **greater than or equal** than y
`x <= y`	x is **lesser than or equal** than y

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`x <= y`	x is **lesser than or equal** than y

Demo

- Are two strings the same?
- Are two **bool** values different?
- Is this number greater than or equal that other one?

Logical operators

We use logical operators to combine **bool** values. They are the operators with the lowest precedence, any other expression will be evaluated before them.

name	description
x and y	returns True if **x and y are True**
x or y	returns True if either **x or y are True**
not x	**negates x**

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x or y	returns True if either **x or y are True**
not x	**negates x**

Demo

Learn about truth tables

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Checkpoint

Any questions or comments about...

- Comparision operators
- logical operators

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Conditional execution

Almost all useful programs need to be able to check conditions and change its behaviour accordingly. That's what conditional execution provides.

`if` statement

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```
if <condition>:
    <body>
```

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Demo

- What type will the condition in our if statement have?

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`if` statement

the `if` statement is the tool we use for conditional execution in Python

```
if <condition>:
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Demo

- What type will the condition in our if statement have?
- How can we create a if statement that always executes its body?

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`if` statement

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```
if <condition>:
    <body>
```

Demo

- What type will the condition in our if statement have?
- How can we create a if statement that always executes its body?
- What about one that never does it?

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Else clause

The else clause is executed when the condition is evaluated to false:

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```
if <condition>:
    <block>
else:
    <block>
```

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```
if <condition>:
    <block>
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    <block>
```

Demo

- Check if a user can drive

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Else clause

The else clause is executed when the condition is evaluated to false:

```
if <condition>:
    <block>
else:
    <block>
```

Demo

- Check if a user can drive
- Tell him to wait some time if they can't

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Elif clause

Elif clauses are used when there are more possibilities:

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```
if <condition>:
    <block>
elif <condition>:
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else:
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```

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    <block>
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```

Demo

- Check if a user can drive

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Elif clause

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    <block>
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Demo

- Check if a user can drive
- Check if they're accompanied by an adult

Elif clause

Elif clauses are used when there are more possibilities:

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if <condition>:
    <block>
elif <condition>:
    <block>
else:
    <block>
```

Demo

- Check if a user can drive
- Check if they're accompanied by an adult
- Tell them to wait otherwise

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Checkpoint

Any questions or comments about conditional execution?

Functions

Functions are sequences of instructions that we store to be executed later.

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Functions receive **input** as parameters, process the input, and produce **output** as return values.

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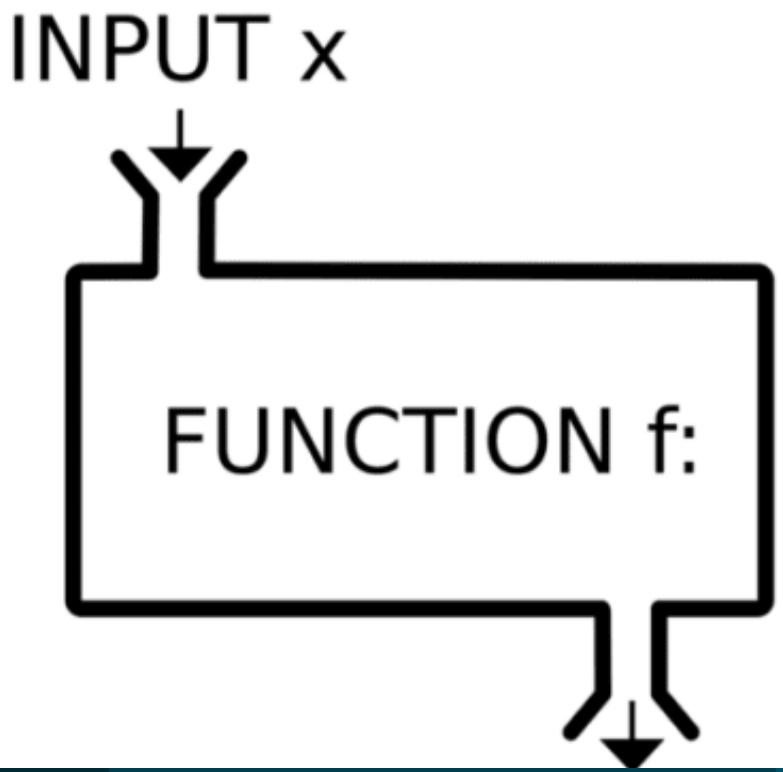

Functions

Calling functions

The syntax for calling functions is the following:

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function_name(parameter1, parameter2, parameterN)
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Demo

Let's do a small demo with the functions we already know.

Functions

Declaring functions

We can declare our own functions using the def keyword with the following syntax:

```
def function_name(parameter1, parameter2):
    #function body
```

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When creating a function we need to indent the body to tell Python what piece of code we want to include inside the function.

Demo

Illustrate why indentation is needed.

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Functions

Returning values from functions

Functions in Python can return values after doing all the operations they perform.

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Demo

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Functions

Function Parameters

Parameters are values that are injected to the function body when we call it

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Demo

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Checkpoint

Regarding functions, we've seen:

- Functions

Checkpoint

Regarding functions, we've seen:

- Functions
- Calling them

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Checkpoint

Regarding functions, we've seen:

- Functions
- Calling them
- Declaring them

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Regarding functions, we've seen:

- Functions
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- Returning values from them

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Checkpoint

Regarding functions, we've seen:

- Functions
- Calling them
- Declaring them
- Returning values from them
- Parameters

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Checkpoint

Regarding functions, we've seen:

- Functions
- Calling them
- Declaring them
- Returning values from them
- Parameters
- **Questions?**

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Practice time!

Let's do some practice. We have to create a function `calculate_area_triangle_rectangle` that can calculate the area of either a triangle or a rectangle.

Let's spend 5 mins trying to solve it individually and we'll do that afterwards together.

Recap

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Create functions with def. Return to produce a value at the end

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Combine comparision & logical operators to check the conditions you need

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Recap

Create functions with def. Return to produce a value at the end

Combine comparision & logical operators to check the conditions you need

Use if, else, elif for conditional execution

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Exercises

1. Create a function `weekly_commute_time` that asks the user their daily commute time and returns their weekly time spent commuting.
2. What do the following expressions return?
   - `True or 11 > 34`
   - `False and (1 == 1)`
   - `(77 // 11) > 6 and False`
3. Create a function `im_in_love` that takes a weekday number (from monday to friday), and returns how that weekday is (according to The Cure!):

```
I don't care if Monday's blue
Tuesday's grey and Wednesday too
Thursday I don't care about you
It's Friday, I'm in love
```

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Recommended read

https://automatetheboringstuff.com/ is a great resource for learning how to apply Python to day to day tasks.

It's a long book, don't try to read it cover to cover but instead pick up the chapters that catch your eye from the index.

You can start reading the chapters on basics, functions, and control flow.

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