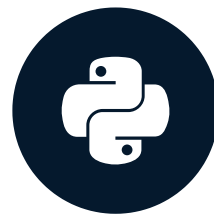


# User-defined functions

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Instructor

# You'll learn:

- Define functions without parameters
- Define functions with one parameter
- Define functions that return a value
- Later: multiple arguments, multiple return values

# Built-in functions

- `str()`

```
x = str(5)
```

```
print(x)
```

```
'5'
```

```
print(type(x))
```

```
<class 'str'>
```

# Defining a function

```
def square():      # <- Function header
    new_value = 4 ** 2    # <- Function body
    print(new_value)
square()
```

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# Function parameters

```
def square(value):  
    new_value = value ** 2  
    print(new_value)
```

```
square(4)
```

```
16
```

```
square(5)
```

```
25
```

# Return values from functions

- Return a value from a function using return

```
def square(value):  
    new_value = value ** 2  
    return new_value  
  
num = square(4)  
  
print(num)
```

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# Docstrings

- Docstrings describe what your function does
- Serve as documentation for your function
- Placed in the immediate line after the function header
- In between triple double quotes `"""`

```
def square(value):  
    """Return the square of a value."""  
    new_value = value ** 2  
    return new_value
```

# Let's practice!

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# Multiple Parameters and Return Values

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# Multiple function parameters

- Accept more than 1 parameter:

```
def raise_to_power(value1, value2):  
    """Raise value1 to the power of value2."""  
    new_value = value1 ** value2  
    return new_value
```

- Call function: # of arguments = # of parameters

```
result = raise_to_power(2, 3)  
  
print(result)
```

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# A quick jump into tuples

- Make functions return multiple values: Tuples!
- Tuples:
  - Like a list - can contain multiple values
  - Immutable - can't modify values!
  - Constructed using parentheses ()

```
even_nums = (2, 4, 6)  
  
print(type(even_nums))
```

```
<class 'tuple'>
```

# Unpacking tuples

- Unpack a tuple into several variables:

```
even_nums = (2, 4, 6)
```

```
a, b, c = even_nums
```

```
print(a)
```

```
2
```

```
print(b)
```

```
4
```

```
print(c)
```

```
6
```

# Accessing tuple elements

- Access tuple elements like you do with lists:

```
even_nums = (2, 4, 6)
```

```
print(even_nums[1])
```

```
4
```

```
second_num = even_nums[1]
```

```
print(second_num)
```

```
4
```

- Uses zero-indexing

# Returning multiple values

```
def raise_both(value1, value2):  
    """Raise value1 to the power of value2  
    and vice versa."""  
  
    new_value1 = value1 ** value2  
    new_value2 = value2 ** value1  
  
    new_tuple = (new_value1, new_value2)  
  
    return new_tuple
```

```
result = raise_both(2, 3)  
  
print(result)
```

```
(8, 9)
```

# Let's practice!

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# Bringing it all together

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# You've learned:

- How to write functions
  - Accept multiple parameters
  - Return multiple values
- Up next: Functions for analyzing Twitter data

# Basic ingredients of a function

- Function Header

```
def raise_both(value1, value2):
```

- Function body

```
    """Raise value1 to the power of value2  
    and vice versa."""
```

```
    new_value1 = value1 ** value2
```

```
    new_value2 = value2 ** value1
```

```
    new_tuple = (new_value1, new_value2)
```

```
    return new_tuple
```

# Let's practice!

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# Congratulations!

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# Next chapters:

- Functions with default arguments
- Functions that accept an arbitrary number of parameters
- Nested functions
- Error-handling within functions
- More function use in data science!

# Let's practice!

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