

Cheat Sheet - Day 1

Introduction to Data Analysis with Python

<https://github.com/janekfleper/Workshop-Konstanz-2024>

Basics

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| <code>x = 1</code> <code>y = "abc"</code> | Assign a value to a <i>variable</i> |
| <code>print("hello")</code> <code>print(x, 2, 3)</code> | Print one or multiple values or variables |
| <code>list(y)</code> <code>len([0, 1, 2])</code> | A <i>function</i> is called with (optional) arguments |
| <code>y.count("a")</code> <code>"abc".upper()</code> | A <i>method</i> is called on a value or on a variable |
| <code># a comment</code> | A <code>#</code> starts a <i>comment</i> that will not be evaluated |
| <code>type(x)</code> | Get the <i>type</i> of a value or of a variable |

Data types

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| <code>"hello", 'abc',</code> <code>"0.9", str(123)</code> | A <i>string</i> is a sequence of characters in quotes |
| <code>12, -4, int("5")</code> | An <i>integer</i> is a number without a decimal part |
| <code>0.9, -3.1415,</code> <code>float("-0.1")</code> | A <i>float</i> is a number with a decimal part |
| <code>True, False,</code> <code>bool(0), x < 1</code> | A <i>boolean</i> can only take the values <code>True</code> or <code>False</code> |
| <code>[0, "abc", 0.1]</code> <code>list("hello")</code> | A <i>list</i> is a mutable, sorted collection of values |
| <code>{"a": 1, "b": 2}</code> <code>dict(a=1, b=2)</code> | A <i>dictionary</i> is a mutable collection of key-value pairs |
| <code>(0, "0.9", True)</code> <code>tuple([0, 1, 2])</code> | A <i>tuple</i> is an immutable, sorted collection of values |

Strings

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| <code>s = "hello"</code> | Initialize a string |
| <code>len(s)</code> | Get the length of a string |
| <code>s[2], s[1:-1]</code> | Get characters from a string |
| <code>s[::-1]</code> | Get a string in reverse order |
| <code>"he" in s</code> | Check if a string contains a substring |
| <code>s + "abc"</code> | Concatenate/append strings |
| <code>s * 10</code> | Repeat a string <i>N</i> times |
| <code>s.isalpha()</code> <code>s.isnumeric()</code> | Check properties of the characters in a string |

Lists

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| <code>x = [1, 2, 3]</code> | Initialize a list with values |
| <code>len(x)</code> | Get the length of a list |
| <code>x[2], x[0:-1]</code> | Get values from a list |
| <code>x[::-1]</code> | Get a list in reverse order |
| <code>x[0] = 3</code> | Change a value in a list |
| <code>x.append(4)</code> | Append a value to a list |
| <code>x.extend([4, 5])</code> | Extend a list by another list |
| <code>y = x + [4, 5]</code> | Add lists to create a new list |

Dictionaries

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| <code>d = {"a": 1, "b": 2}</code> <code>d = dict(a=1, b=2)</code> | Create a dictionary with key-value pairs |
| <code>d["a"]</code> | Get the value of a key from a dictionary |
| <code>d["a"] = 0</code> <code>d["c"] = 3</code> | Update/add a key-value pair in/to a dictionary |
| <code>d.keys()</code> <code>d.values()</code> <code>d.items()</code> | Get all keys, all values or all key-value pairs in a dictionary |

for loops

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| <code>range(n)</code> <code>range(m, n)</code> | Create a sequence from 0 / m to n-1 in steps of 1 |
| <code>for i in range(n):</code> <code>print(i)</code> | Iterate over the integer values in a sequence |
| <code>for c in "hello":</code> <code>print(c)</code> | Iterate over the characters in a string |
| <code>for v in [0, -1, 2]:</code> <code>print(v)</code> | Iterate over the values in a list |
| <code>for k in d.keys():</code> <code>print(k)</code> | Iterate over the keys in a dictionary |
| <code>x = [1, -5, 3, 0]</code> <code>y = [v+1 for v in x]</code> | Create a new list with a list comprehension |

Conditions and if - elif - else statements

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| <code>a == b, a != b</code> <code>a > b, a >= b</code> <code>a < b, a <= b</code> | Compare two values, the result will be <code>True</code> or <code>False</code> |
| <code>if a < 0:</code> <code> a = -a</code> <code>elif a < 10:</code> <code> a = a - 10</code> <code>else:</code> <code> a = a * 5</code> | Check a condition with an <code>if</code> statement. Check multiple conditions with <code>if</code> and <code>elif</code> (as many as you want). The (optional) <code>else</code> block handles all other cases. |

Jupyter shortcuts

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| <code>Enter</code> / <code>Esc</code> | Start/exit the edit mode |
| <code>Shift</code> + <code>Enter</code> | Run cell(s) and select next |
| <code>A</code> / <code>B</code> | Insert new cell above/below |
| <code>X</code> , <code>C</code> , <code>V</code> | Cut, copy or paste cell(s) |
| <code>Z</code> / <code>Shift</code> + <code>Z</code> | Undo/redo cell operation |