Python Programmierkurs

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Introduction

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About me:

- Master student in computer science
- mainly working with deterministic ethernet networks (simulations (in C++))

About the course:

- 10 weeks
- 3 part per week
- one final goal

Motivation

Motivation

Why Python?

- common language in science
- fast development
- most of the time easy to read

Why this course?

- Learn by doing
- Learn to Learn
- Learn to commuinicate
- Understand the background

The big goal

We will do some fancy machine learning stuff:

- Develope a classifier by hand
- Preprocess data
- Use a library to do the same (because we are lazy)
- Evaluate the results
- If time and interest allows: Neural Networks

Setup

Setup

What software do you need?

- Python 3.12
- VS-Code
- git

Setup - AMCS

Go to:

`https://amcs.website/`

and enter the pin: **1234567**

Installation - Windows

Windows Python:

- `https://www.python.org/downloads/windows/`
- Windows 64bit Installer

Windows VS-Code:

- `https://code.visualstudio.com/download`

Windows git:

- `https://git-scm.com/download/win`
- 64bit for Windows setup

Installation - MacOs

Homebrew:

- `https://brew.sh/`
- execute *Install Homebrew* code in terminal

Python - if not installed:

```
$python --version
$python3 --version
$brew install python
```

git:

```
$brew install git
```

VS-Code:

- `https://code.visualstudio.com/download`

Lets Start

What is the computer doing

- CPU - execute instructions

What is the computer doing

- CPU - execute instructions
- Instruction Set (x86, ARM, ...)

What is the computer doing

Pseudocode

```
c = 8 + 10
print(c)
```

x86 Assembly & Opcode

```
mov     eax, 8
mov     ebx, 10
add     eax, ebx
push    eax
push    fmt
call    printf
mov     eax, 1
int     0x80
```

What is the computer doing

Pseudocode

```
c = 8 + 10
print(c)
```

x86 Assembly & Opcode

```
b8 08 00 00 00
bb 0a 00 00 00
01 d8
50
68 00 00 00 00
e8 00 00 00 00
b8 01 00 00 00
cd 80
```

What is the computer doing

- CPU - execute instructions
- Instruction Set (x86, ARM, ...)
- Compiler - translate code to instructions

First steps in Python

First steps in Python

print()	print something to the console
+,-,*,/	basic math operations
=	assign a value to a variable
ctr + d	terminate the interactive python shell

First Task: Print the result of $8 + 10$ to the console.

Second Task: Find out how to calculate 8^2

First steps in Python

```
>>> print(8 + 10)
18
>>> print(8 ** 2)
64
```

Source files

Clone the repository and open it with VS Code:

```
$ git clone
    https://github.com/Jannusch/python_course.git
$ cd python_course
$ code .
```

Solve the tasks and ask questions

Next week:
Control structures and Memory