

Search Based Software Engineering

Python Tutorial Tasks

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Deadline: 23.04.2018 23:59

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Submission details compress your files (.zip or .tar.gz)
include a file with your name and Matrikelnummer

Hint: This first exercise is not graded! It is just a training.

Exercise 1. Rock Paper Scissors

A basic tutorial exercise to learn Python

Concepts:

- learn how to deal with user input
- learn how to write checks
- learn loops
- learn the random module

Task:

- Write a Python 3 script which lets a user play “rock-paper-scissors” against the computer
- It should read the standard input for either “stone”, “paper”, “scissors” and generate a random response
- The selection of both the user and the script should be displayed on the console
- Additionally, the game should run in a loop, asking for another round
- Count the amount of wins / losses for the user and the computer and print the count after each round

Exercise 2. Numpy 1

- a) import numpy
- b) create an array a with values from 1 to 3
- c) create an array b with random values between 0 and 100 of length 3
- d) multiply a with b
- e) calculate the dot product of a and b
- f) calculate the cross product of a and b

Exercise 3. Numpy 2

- a) create a matrix x with random values from 1 to 100 of shape 10x10
- b) calculate the determinant of x

Exercise 4. Numpy 3

- a) implement a function that gets a numpy array as argument
- b) the function should change every even value to its negative

```
# input array
np.array([1,2,3,4,5,6,7,8,9])

# output array
np.array([1,-2,3,-4,5,-6,7,-8,9])
```

Exercise 5. Numpy 4

- a) write a function that has two numpy arrays as arguments
- b) the function should return an numpy array of all elements that are shared between both input arrays

```
# input
np.array([1,2,3,4,5,6,7]),
np.array([23,12,76,23,1,45,5])

#output
np.array([1,5])
```
