Search Based Software Engineering

Python Tutorial Tasks

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Deadline: 22.04.2019 23:59

Submit to: andre.karge@uni-weimar.de

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 excercise 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])
```