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AI VIII – Serious Games

UNIVERSITÄT BAYREUTH

Exercises for **Programming, Data Analysis, and Deep Learning in Python** (SoSe 2021)

Exercise Sheet no. 1, *Deadline*: Monday, April 19, 10:15

Notes

- Always explain your solution.
- Handing in in groups of two is possible and desired. Only *one* submission per group! (All participants will get the credit).
- Unless stated otherwise, submissions should be uploaded on e-Learning. Name your file with the first and last names of all participants. Additionally, add these names as a comment at the beginning of your file.
  Example: Names of team mates: Erika Mustermann, Rudi Ratlos ⇒ File name: `ex1_Erika-Mustermann_Rudi-Ratlos.ipynb`
- Programming exercises should be submitted as `.py` or `.ipynb` files. Write the answers to text questions in programming tasks as a comment in the file.
- Exercises that do not have the "programming exercise" tag can be submitted as `.py`, `.ipynb`, `.txt`, or `.pdf` files.

Exercise 1 Integers and Floats (programming exercise) (5 points)

a) Does the following code produce an error? If yes, why? If no, what is the output?

```
1 + 2 + - 3
```

b) Does the following code produce an error? If yes, why? If no, what is the output?

```
1 + 2 + * 3
```

c) What is the difference between `1` and `1.0`?

d) What is the type of the variable `tempvar`?

```
tempvar = 1 / 2.0 + 1
```

e) What does the variable `temp` contain after the following code runs and why?
Hint: Output `temp` at the end.

```
temp = 11
temp *= 2
temp - 2
```

Exercise 2 Floats and Boolean (programming exercise) (5 points)

a) What does `inf` mean? When does it occur in Python?

b) The expression `3 != 3` is of boolean type. Which values can boolean variables have?

c) Write a Python script that asks for two numbers and stores them in the variables `x` and `y`, respectively. Make sure that `x` and `y` are of type *float*. The script should then check whether `x` equals `y`. Why is the following code not a good idea to do so? Provide a better solution.

```
x == y
```

Exercise 3 Strings (programming exercise) (8 points)

a) Why does this expression cause an error? How can you fix it?

```
'I have eaten ' + 25 + ' peas.'
```

b) Which of the following is a variable, and which is a string? What Python command can be used to determine the type of an expression?

```
'temp'
temp
```

c) Write a Python script that does the following:

1) Ask the user for their name and store that information in the variable `username`.
2) Greet the user with a (`print`) message that includes the user's name.
3) Calculate and output the length of the user's name.
4) Ask for the user's year of birth and store that information in the variable `yob`.
5) Output a message that includes the user's age. Can you always calculate the user's age correctly in this way? Why or why not?

Exercise 4 Lists (programming exercise) (6 points)

a) What is `[]`?

b) Is this a valid list? Explain.

```
LL = [1, 2, 3, 4, 'five', 6, 7]
```

c) Consider the following list:

```
L = ['zz', 'yy', 'xx', 'ww', 'vv']
```

1) What does `L[-1]` evaluate to? What does `L[:3]` evaluate to?
2) How can you access the first element of the list?
3) Delete the second last element.
4) Add the element `'11'` at the beginning of the list.