Assignment 6 - Simulations and Data Processing

- The problems of this assignment must be solved in Python.
- The TAs are grading solutions to the problems according to the following criteria: https://grader.eecs.jacobs-university.de/courses/350112/2018_1gB/Grading-Criteria-Python.pdf

Problem 6.1 *Raquetball simulation* (1 point)

Presence assignment, due by 18:30 h today

Put the code pieces from the slides (Lecture 5&6, top-down design) together and create a running simulation. Complete the input and output functions with suitable text messages.
Upload one file: `rqballsim.py`.

Problem 6.2 *Improved raquetball simulation* (1 point)

Presence assignment, due by 18:30 h today

There is still room for improvement in the program for **Problem 6.1**. Try to reduce the number of `if`-statements by using dictionary(ies) for `prob`, `score` and `wins`. You should also write a simple function that alternates between "`A`" and "`B`".
Upload one file: `rqballsimimp.py`.

Problem 6.3 *Volleyball simulation* (1 point)

Volleyball is played like racquetball only the serving team can score. Games are played until 15 points, but must be won by at least 2 points difference.
In *sanctioned versions of volleyball* a team scores independently if it serves or not (rally scoring). Games are played until 25 points.
Write a program that compares the two types of volleyball games and investigates whether rally scoring has some effect on the relative advantage a team has.
Upload one file: `vballsim.py`.

Problem 6.4 *Weather data I* (1 point)

Write a program where you need to enter from the keyboard a month as an integer. Your program should fetch the weather data for the corresponding month in 2008 from
`https://grader.eecs.jacobs-university.de/courses/350112/python/csv/exp2008xx.csv` (`xx` replaced by the actual month number) and copy the content it into a local file on your hard drive.
You can assume that the input will be valid.
Upload two files: `weather1.py` and `wdata1.csv`.

Problem 6.5 *Weather data II* (1 point)

Using the `csv` module, and the examples from the slides (Lecture 5&6, pages $64 - 69$), parse the data and rewrite some data for the 11th day of month 3 to another `csv` file. The following data should be written to the file: date and time in the %y-%m-%d %H:%M format, temperature, humidity (German: Feuchte), wind, and direction (German: Richtung). The entries per line should be separated by commas.
Upload two files: `weather2.py` and `wdata2.csv`.

Problem 6.6 *Weather data and regular expressions* (1 point)

Modify the previous program to use the `re` module and `re.sub` function, extract the data of the 15th day of month 7 and rewrite/replace the year to be 2018. The result should be written into a file called `wdata3.csv`.
Upload two files: `regexw.py` and `wdata3.csv`.

How to submit your solutions

Name the programs a6_*x*.py.
Each program **must** include a comment on the top like the following:

```
# JTSK-350112
# a6_1.py
# Firstname Lastname
# myemail@jacobs-university.de
```

You have to submit your solutions via *Grader* at
`https://grader.eecs.jacobs-university.de`.

If there are problems (but only then) you can submit the programs by sending mail to
`k.lipskoch@jacobs-university.de` **with a subject line that starts with `JTSK-350112`**.

Please note, that after the deadline it will not be possible to submit solutions. It is useless to send solutions then by mail, because they will not be accepted.

Your code must compile without any warning under python3.x.

This assignment is due by Wednesday, May 9th, 10:00 h