Information on exercises   **Karin Zojer**

Due date: exercise1 by May 23rd 2018

Hand in:

- a protocol containing the MATLAB script(s), the graphs, and a discussion
- in case you jointly develop a protocol, please clearly indicate the names of your fellow students

Amount:

- consider Task 1e) as bonus
- the protocol ought to contain the documentation for the tasks you managed to complete until then

Feedback on the protocols:

- The protocol will form the basis for your oral exam
- I will comment the protocols.

Feedback to me:

In general, feedback on the code, encountered bugs, etc. are welcome. Also, your ideas how to improve handling, or how to extent it to pursue further scientific questions are *welcome*. In collecting this feedback, you will support me in improving the versatility of the exercise, e.g., by extending the ability of the code:

Optionally, projects pursuing further aspects of the originally given tasks can be assigned. These projects are selected to aid to improve the exercises in the future. When completed, the discussion of the project will serve as essential part of the oral exam. If you decide to go for an assignment, please contact me first to get further details.

Topics for project assignments are:

- **Going beyond the DOS-shape derived effective mass (I):**
  Modify the code to consider multiple band maxima (minima), e.g., heavy and light hole masses
- **Going beyond the DOS-shape derived effective mass (II):**
  How would one modify the code to consider valence and conduction bands whose shape differs from an isotropic, parabolic shape in k-space?
- **Code portability**: Translate the code into Java, C++, or Fortran while keeping the modular structure of solving the tasks

Graz, 18.04.2018