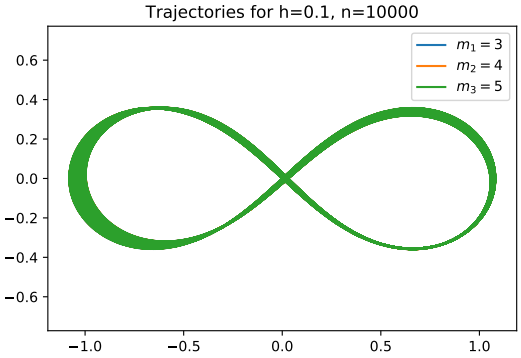
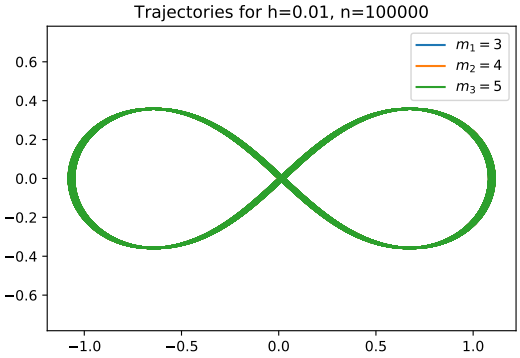
Exercise sheet 2

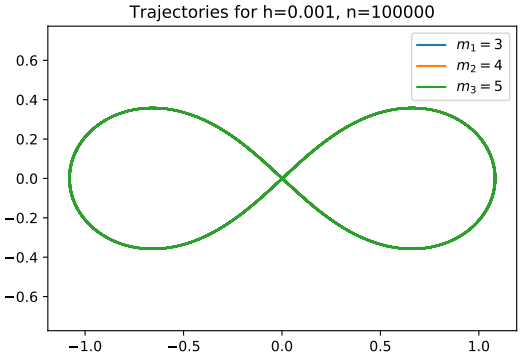
by Maximilian Richter and Christian Heppe

Exercise 2)

a) Trajectories of the three masses for different values for stepsize h





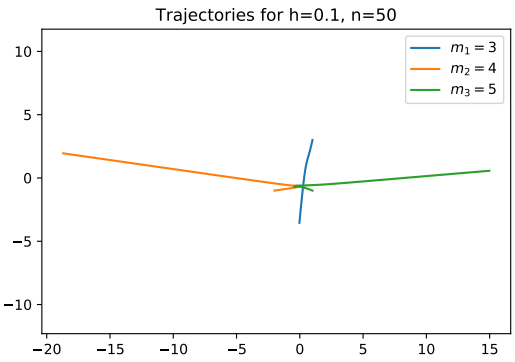


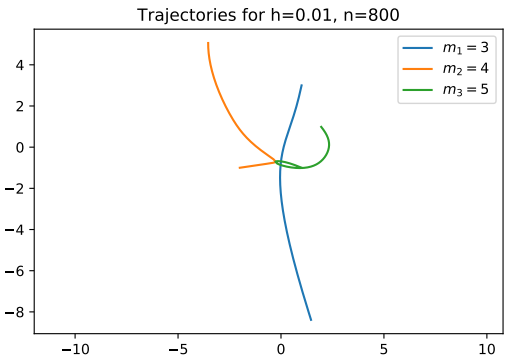
As one can see, after multiple periods, the orbits changes its shape for big values of h. The smaller one sets h, the more precise the orbit of the bodies will stay over time

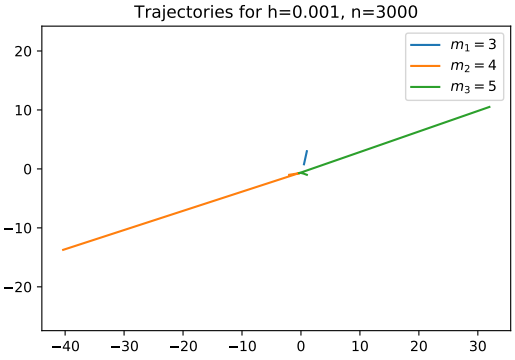
b) Meissel-Burrau problem

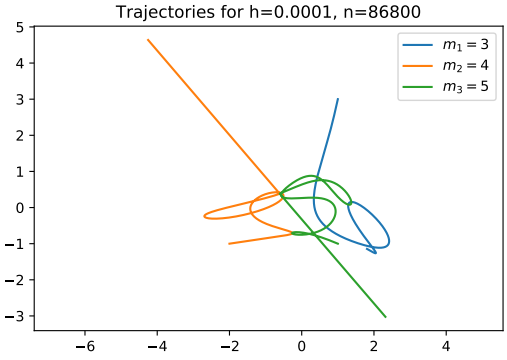
We observe that for a minimum value of h=0.0001 we can obtain reliable estimates for the time of the first five closest encounters of the three masses.
For a better understanding of the shown trajectories we added a GIF-file into the ZIP-archive showing the movement of the three masses for the last configuration as a short animation For further details see the python-code in the appendix.

i) Trajectories on the orbital plane

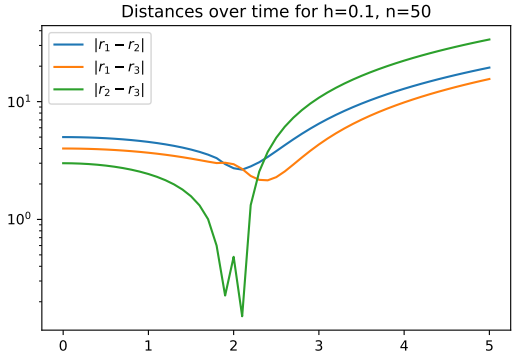


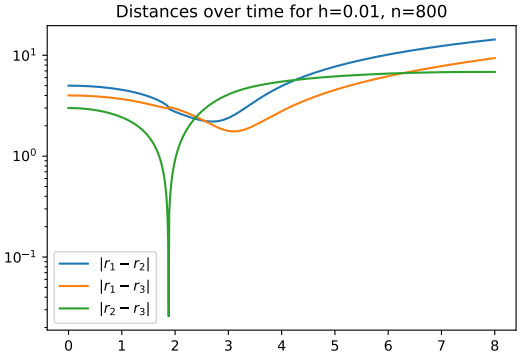


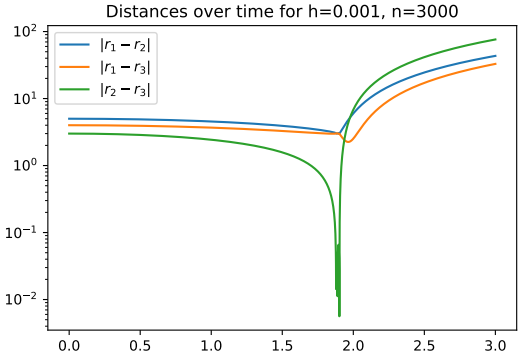


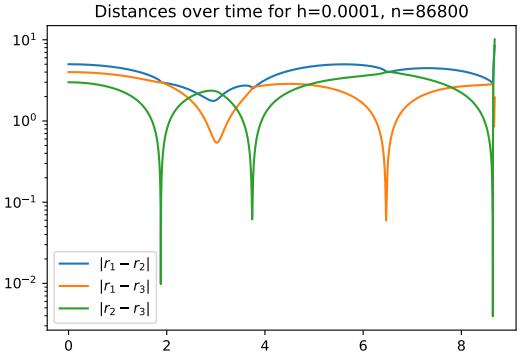


ii) Relative distances of the bodies









iii) Total Energy