Exercise 2, 26.11

Main file: crank_slider.m

The beginning starts with definition of initial values of the system. As we need to find the x, which contains two things: angle theta and length d and its derivatives, 4 pre-allocated arrays are defined: theta, d, dtheta, dd.

For calculation of Jacobian and Constraint equation matrix two functions were created. These functions are not for general and created for this specific task, that just simplifies a bit the code. The whole process of iterating is created via the usage of 'for'-loop. The values of the derivatives are calculated through the usage of the Jacobian. Also, as we need to store our solution for each step somehow, the initial guess is created (x0) and the values for solutions are extracting from the value u = x0.

As a results we obtain next plots, that are represent the behavior of the system (figure 1 and 2)