

## Assignment

1. Install Python + VTK library.
2. Modify LV1\_solution.py
3. Create a class *robot* which will contain the parameters of the considered robot manipulator. Based on the kinematic parameters calculated in preparation for the exercise, create vectors  $\theta$ ,  $d$ ,  $a$  and  $\alpha$  containing these parameters of all joints. Enter angles in radians. Additionally, create links and a robot manipulator tool and place them on the scene using transformation matrices.
4. Display the considered robotic manipulator on the computer screen for different values of the joint variables.
5. Determine the homogeneous transformation matrix that describes the pose of the tool relative to the base coordinate system for the values of the joint variables given in point 4.
6. Determine the homogeneous transformation matrix describing the pose of a cube A in which the cube is inside the robot gripper such that its sides are aligned with the sides of the gripper, with the robot in the pose given in point 4.
7. Display on the computer screen the robotic manipulator and cube A in the pose determined in point 6.
8. Upload your report along with the Python source code. The report should include a description of the task, images of your manipulator (schema), a table of calculated DH parameters, and a few images generated by running your code for each point in the above given task.