Name: Artturi Korhonen

Student number: 792321

Date: 19.2.2024

Course: ELEC-E8126 - Robotic manipulation D

Exercise 3

Question 1: The original pick and place poses had to be rotated 180 degrees with respect to the x-axis to match the desired end effector pose. This was done using translation matrix $T = R_x(\pi)$.

The pre-grasp pose was 0.1 m above the grasp pose, which was obtained by translating that frame by -0.1 m in z-axis using $T = T_z(-0.1)$ (negative since z-axis pointed downwards after the rotation).

Question 2: MoveIt assumes that the poses are defined in the robot's base frame. If a pose is defined with respect to another frame, that pose should be translated into the base frame using translation matrices.

Question 3: Cartesian path computation calculates a direct path between two specified points whereas planning takes the robot arm's configuration space into account and tries to find a collision free path between these two points.

Question 4: Ideally, the object should not move by being touched by the robot before grasping. In this exercise, the cartesian path from pre-grasp pose to grasp pose approaches the object from above where the robot does not touch the object before grasping.

Question 5: MoveIt's path planning algorithm should make sure that the computed path has no self-collisions. Also, the cartesian movement should not have this problem either.