ME449-Capstone

Final Capstone Project of ME449 Introduction to Robotic Manipulation

General assignments of ME449 can be found here

This project is broken down into 3 milestones:

Milestone 1 - youBot Kinematics Simulator and csv output

Milestone 2 - Reference Trajectory Generation

- My code for this milestone contains three functions:
  - scTose(): this function computes the transformation matrices in the end effector frame from those given in the cube frame
  - InitTG(): this function just sets up the various transformation matrices for the gripper and cube
  - TrajectoryGenerator(): This function computes the trajectories by:
    - Iterating through the eight segments defined in traj_iter
    - Each segment has a specified duration in t
    - From these the inputs to ScrewTrajectory are generated
    - In each iteration the results of ScrewTrajectory are appending to a list of trajectories and the corresponding gripstates are appending to grip_states as well
    - After this the csv file is creates
- Running the code can be done in two ways:
  - The first is by running the command below from a python terminal in the directory where TrajectoryGenerator.py is
  - The second is by running the file in Visual Studio Code

```
import TrajectoryGenerator as TG
TG.TrajectoryGenerator()
```

Milestone 3 - Feedforward Control