National Yang Ming Chiao Tung University

Department Electrical Engineering

Robotics Project: Part 1

Due: 11/17/22 Fall 2022

For a Stanford type robot manipulator with the following kinematic table,

Joint	d(in)	a(in)	α	θ
1	0	0	-90°	0°
2	6.375	0	90°	0°
3	d_3	0	0°	0°
4	0	0	-90°	0°
5	0	0	90°	0°
6	0	0	0°	0°

$$-160^\circ \leq \theta_1 \leq 160^\circ,\ -125^\circ \leq \theta_2 \leq 125^\circ$$
$$-30\ in \leq d_3 \leq 30\ in,\ -140^\circ \leq \theta_4 \leq 140^\circ$$
$$-100^\circ \leq \theta_5 \leq 100^\circ,\ -260^\circ \leq \theta_6 \leq 260^\circ$$

please write a program for the following two transformations:

- input: Cartesian point (n, o, a, p), output: the corresponding joint variables.
- input: joint variables, output: Cartesian point (n, o, a, p) and (x, y, z, ϕ, θ, ψ).