National Yang Ming Chiao Tung University
Department Electrical Engineering

Robotics Project: Part 1
Due: 11/30/23   Fall 2023

For a PUMA 560 robot manipulator with the following kinematic table,

Joint	d(m)	a(m)	α	θ
1	0	0	-90°	0°
2	0	0.432	0°	0°
3	0.149	-0.02	90°	0°
4	0.433	0	-90°	0°
5	0	0	90°	0°
6	0	0	0°	0°

$$-160° \leq \theta_1 \leq 160°, \; -125° \leq \theta_2 \leq 125°$$

$$-135° \leq \theta_3 \leq 135°, \; -140° \leq \theta_4 \leq 140°$$

$$-100° \leq \theta_5 \leq 100°, \; -260° \leq \theta_6 \leq 260°$$

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).