1.**2R Manipulator:**

Type: Two-revolute joints on a flat plane (used for planar arms and plotting tests)

Robot geometry:

- Two links of 0.25 m each
- Base at origin (α = 0°)
- All joints revolute

Link	a(i-1) (m)	alpha(i-1) (deg)	d(i) (m)	theta(i) (deg)	joint_type	q_min	q_max
1	0.25	0.0	0.0	0.0	R	-180	180
2	0.25	0.0	0.0	0.0	R	-180	180

2.**3R Manipulator:**

Type: Three revolute joints on a plane (common teaching robot)

Robot geometry:

- Link1 = 0.25 m
- Link2 = 0.25 m
- Link3 = 0.1 m
- All joints revolute

Link	a(i-1) (m)	alpha(i-1) (deg)	d(i) (m)	theta(i) (deg)	joint_type	q_min	q_max
1	0.25	0.0	0.0	0.0	R	-180	180
2	0.25	0.0	0.0	0.0	R	-180	180
3	0.10	0.0	0.0	0.0	R	-180	180

3.**Scara Manipulator:**

Type: Selective Compliance Assembly Robot Arm — 2 revolute + 1 prismatic joint

Robot geometry:

- Base height = 0.4 m
- Link1 = 0.3 m
- Link2 = 0.2 m
- Vertical prismatic link (range 0.1–0.3 m)

Link	a(i-1) (m)	alpha(i-1) (deg)	d(i) (m)	theta(i) (deg)	joint_type	q_min	q_max
1	0.3	0.0	0.4	0.0	R	-180	180
2	0.2	0.0	0.0	0.0	R	-180	180
3	0.0	0.0	0.1	0.0	P	0.1	0.3

4.**cylindrical Manipulator:**

Type: Prismatic–Revolute–Prismatic (used for vertical assembly)

Link	a(i-1) (m)	alpha(i-1) (deg)	d(i) (m)	theta(i) (deg)	joint_type	q_min	q_max
1	0.0	0.0	0.2	0.0	P	0.1	0.4
2	0.0	90.0	0.0	0.0	R	-180	180
3	0.3	0.0	0.0	0.0	P	0.0	0.3

5.**Cartesian Manipulator:**

Type: Three orthogonal prismatic joints (pure translation)

Link	a(i-1) (m)	alpha(i-1) (deg)	d(i) (m)	theta(i) (deg)	joint_type	q_min	q_max
1	0.0	0.0	0.0	0.0	P	0.0	0.4
2	0.0	90.0	0.0	0.0	P	0.0	0.4
3	0.0	0.0	0.0	0.0	P	0.0	0.4