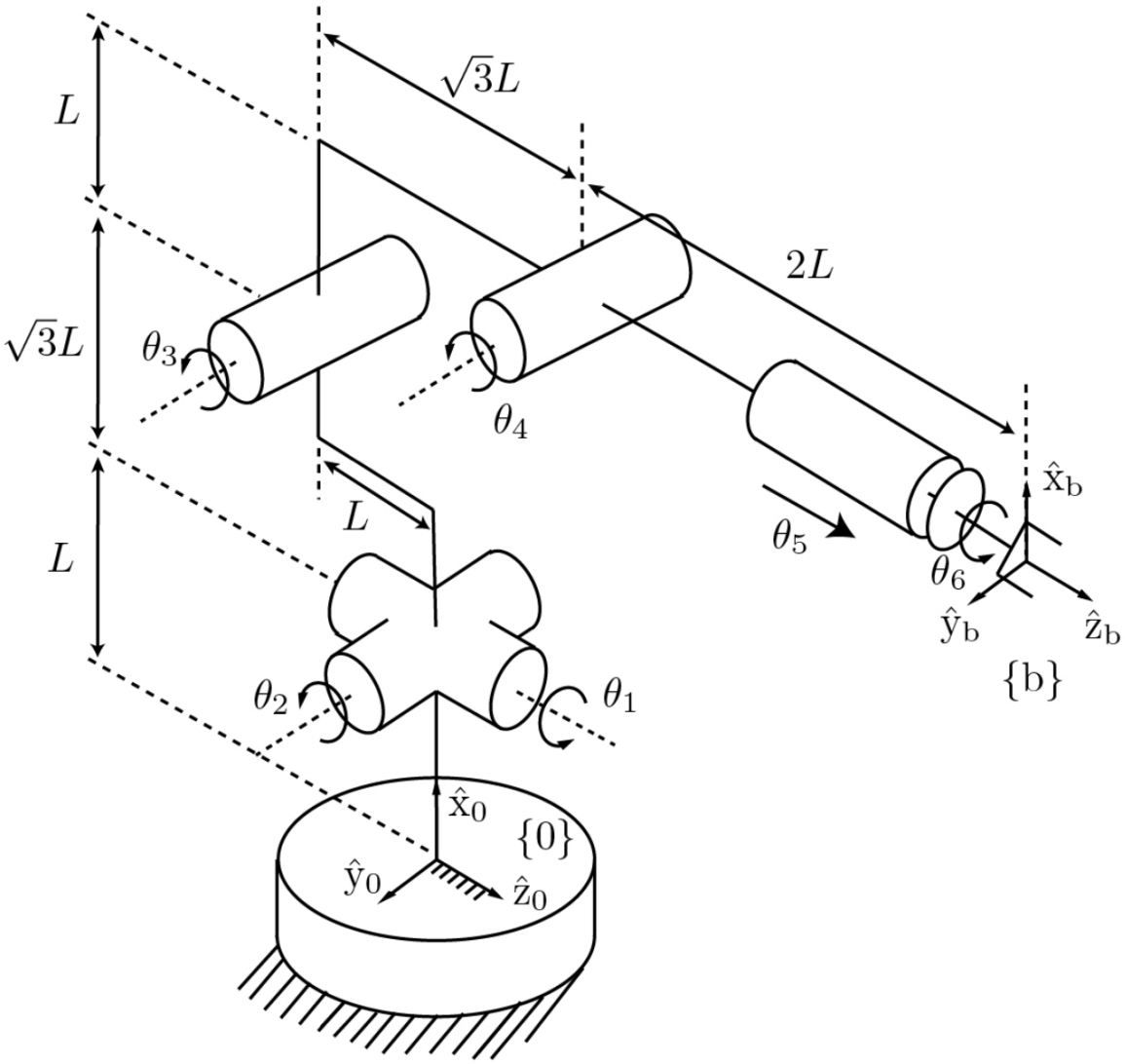
## Congratulations! You passed!

Grade received 100% Latest Submission Grade 100% To pass 80% or higher

Go to next item

**1.** The URRPR spatial open chain robot is shown below in its zero position. 1 / 1 point




For $L = 1$, determine the end-effector zero configuration $M$. The maximum allowable error for any number is 0.01, so give enough decimal places where necessary.

**Write the matrix in the answer box and click "Run":**

[[1.11,2.22,3.33],[4.44,5.55,6.66],[7.77,8.88,9.99]] for $\begin{bmatrix} 1.11 & 2.22 & 3.33 \\ 4.44 & 5.55 & 6.66 \\ 7.77 & 8.88 & 9.99 \end{bmatrix}$.

```
1  [[1,0,0,3.732],[0,1,0,0],[0,0,1,2.732],[0,0,0,1]]
```

Run

Reset

Correct

Good job!

**2.** Referring back to Question 1, determine the screw axes $\mathcal{S}_i$ in {0} when the robot is in its zero position. Again $L = 1$. Give the axes as a 6x6 matrix with the form $[\mathcal{S}_1, \mathcal{S}_2, \ldots, \mathcal{S}_6]$, i.e., each column is a screw axis. The maximum allowable error for any number is 0.01, so give enough decimal places where necessary. 1 / 1 point

**Write the matrix in the answer box and click "Run":**

[[1.11,2.22,3.33],[4.44,5.55,6.66],[7.77,8.88,9.99]] for $\begin{bmatrix} 1.11 & 2.22 & 3.33 \\ 4.44 & 5.55 & 6.66 \\ 7.77 & 8.88 & 9.99 \end{bmatrix}$.

```
1  [[0,0,0,0,0,0],[0,1,1,1,0,0],[1,0,0,0,0,1],[0,0,1,-0.732,0,0],[-1,0,0,0,0,-3.732],[0,1,2.732,3.732,1,0]]
```

Run

Reset

**Correct**

Good job!

**3.** Referring back to Question 1, determine the screw axes $\mathcal{B}_i$ in {b} when the robot is in its zero position. Again $L = 1$. Give the axes as a matrix with the form $[\mathcal{B}_1, \mathcal{B}_2, \ldots, \mathcal{B}_6]$. The maximum allowable error for any number is 0.01, so give enough decimal places where necessary.

**1 / 1 point**

**Write the matrix in the answer box and click "Run":**

[[1.11,2.22,3.33],[4.44,5.55,6.66],[7.77,8.88,9.99]] for $\begin{bmatrix} 1.11 & 2.22 & 3.33 \\ 4.44 & 5.55 & 6.66 \\ 7.77 & 8.88 & 9.99 \end{bmatrix}$.

```
1  [[0,0,0,0,0,0],[0,1,1,1,0,0],[1,0,0,0,0,1],[0,2.732,3.732,2,0,0],[2.732,0,0,0,0,0],[0,-2.732,-1,0,1,0]]
```

Run

Reset

**Correct**

Good job!

**4.** Referring back to Question 1 and 2, given $L = 1$ and joint variable values $\theta = (-\pi/2, \pi/2, \pi/3, -\pi/4, 1, \pi/6)$, use the function `FKinSpace` in the given software to find the end-effector configuration $T \in SE(3)$. The maximum allowable error for any number is 0.01, so give enough decimal places where necessary.

**1 / 1 point**

**Write the matrix in the answer box and click "Run":**

[[1.11,2.22,3.33],[4.44,5.55,6.66],[7.77,8.88,9.99]] for $\begin{bmatrix} 1.11 & 2.22 & 3.33 \\ 4.44 & 5.55 & 6.66 \\ 7.77 & 8.88 & 9.99 \end{bmatrix}$.

```
1  [[0.5,0.86,0,1],[0.2241,-0.1294,-0.9659,-1.8978],[-0.8365,0.4830,-0.2588,-4.5084],[0,0,0,1]]
```

Run

Reset

**Correct**

Good job!

**5.** Referring back to Question 1 and 3, given $L = 1$ and joint variable values $\theta = (-\pi/2, \pi/2, \pi/3, -\pi/4, 1, \pi/6)$, use the function `FKinBody` in the given software to find the end-effector configuration $T \in SE(3)$. The maximum allowable error for any number is 0.01, so give enough decimal places where necessary.

**1 / 1 point**

**Write the matrix in the answer box and click "Run":**

[[1.11,2.22,3.33],[4.44,5.55,6.66],[7.77,8.88,9.99]] for $\begin{bmatrix} 1.11 & 2.22 & 3.33 \\ 4.44 & 5.55 & 6.66 \\ 7.77 & 8.88 & 9.99 \end{bmatrix}$.

```
1  [[0.5, 0.86, 0, 1], [0.2241, -0.1294, -0.9659, -1.8978], [-0.8365, 0.483, -0.2588, -4.5084], [0, 0, 0, 1]]
```

Run

Reset

**Correct**

Good job!