COMP 3766 - Lab2 Quiz

(Always include 4 decimal places if the answer has a decimal part)

Question 1 **2 points**

For your PUMA robot, consider that the robot is in its zero position (all joints are at zero angles). Using the robot's kinematic model, describe what the pose (position and orientation) of link 3 would be in the base frame of the robot. You can refer to the TF tree in RViz to visualize how link3 is positioned relative to the base frame in the robot's zero configuration.

A) In the zero configuration, link3 is aligned with the base frame in terms of position. Since all joints are at zero, link3 would be located at its initial offset relative to the base frame *(the exact position of which depends on the robot's parameters)*. The orientation of link3 would also be aligned with the base frame *(because the rotation matrices for all joints are identity matrices when in the zero position)*

In RViz, link3's position relative to the base frame would be (x, y, z), with the orientation as xyzw `(0, 0, 0, 1)` if no rotations have occurred.

Question 2 **2 points**

Fill in the blanks with the values from the respective joint

Joint 1 origin xyz	0	0	0.67
Joint 2 origin xyz	-0.15	0	0.67
Joint 3 origin xyz	-0.15	0.432	0.67

Note: *Link3's position is `(0, 0.432, 0)` relative to Link2, and we already know that Link2 is located at `(-0.15, 0, 0.67)` in the base frame. To find Link3's origin in the base frame, we add the position of Link2 to the offset of Link3*

Question 3 **2 points**

Use the joint_state_publisher_gui to set the robot joint1, joint2, joint3 to 0.6, 0.8 and -0.5 respectively.
Fill in the blanks with link3 orientation. You can find this information on the TF menu on Rviz

xyzw	0.1042	-0.6991	0.3086	0.6365

Question 4 — 2 points

Attach to this question a screenshot of your robot after clicking in the randomized button. Make sure to show the joint_state_publisher_gui with the random values