EGR 545 - Spring 2023 - Lab 2

Brayden Jenkins, Sahil Patel

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1 Question 5

Table 1: Axis Information

		Axis/Joint (+/-)	Description (In/Out/Up/Down/Left/Right)
1	Axis	X-axis (+)	Out
2	Axis	X-axis (-)	In
3	Axis	Y-axis (+)	Left
4	Axis	Y-axis (-)	Right
5	Axis	Z-axis (+)	Up
6	Axis	Z-axis (-)	Down

2 Question 11: Hit the "Play" button to run your program and see what happens. Did it work the first time? If not, what did you have to change to make it work?

When running the program the first time, the robot executed the correct movements. When we placed down the cube to test our code, the cube was not correctly aligned with the gripper, which caused the robot to not pick up the cube and place it down in the new position. What we needed to change to make our demonstration work was to readjust the cube's original position until the gripper successfully picks it up and places it down in the target position.

3 Question 12: Change the position type of step #5 (above place) in the first column to Move Linear (MOVL). Run the program. What changed?

When using MOVJ, the robot arm's movements were "shaky." What this means is that when the arm moved from one position to another, it overshot its new position and had to readjust its motion to get there. When running the program, the cube was successfully able to get from its home position to its target position without any issue. When we changed the motion type to MOVL, the movement was smoother and the shakiness problem that we have seen earlier went away. This motion type allows us to see the arm's accurate movements, which can be crucial when needing to measure distances precisely.

4 Conclusion

4 Question 1: How can you get the suction to turn on in time to pick up the part, or get it to shut off in time to drop it off correctly? Explain below after you have tried it in the program.

To get the suction to turn on in time, we had to create a delay between each action. This delay is meant to help the suction machine have enough time to build air to open the gripper and drop the cube. When the gripper needs to pick up the cube, the delay is needed again but this time it is meant for the suction machine to have enough time to release the built up air. Before adding the delay, the gripper would not open and close even though we made sure we programmed the action to do so. Once we saw on the document about needing to add a delay, we began experimenting

how long the delay needed to last to build enough air and to release it. We decided that having a 2 second delay time was more that enough for the robot. Adding any more time would be unnecessary, and using less time would not help the suction machine.

4 Question 2: What happens if you replace the ¾" cylinder with a ¾" wooden cube? Run it and see. Describe below what happens.

We were not able to test this question out because the needed material, the ¾" cylinder, was not available when we were at the lab on February 22, 2023. What could have happened if we had replaced the cube with the cylinder would be that we needed to be more precise in placing down the cylinder at the home position because the cylinder has a smaller area then the cube which could make the gripper slip when it tries picking it up.