W3B CIM [Dobot Cube Matrix] Dobot Magician 4 Blockly

CHRIS & JIM CIM
COMPUTER INTEGRATED MANUFACTURING

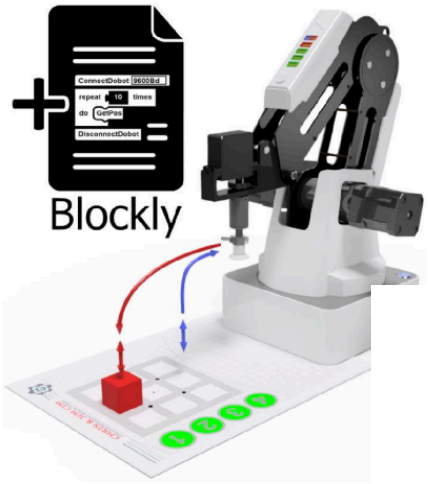
Portfolio link
https://m-jeide.github.io/eng-portfolio/CIM/Dobot%20Magician

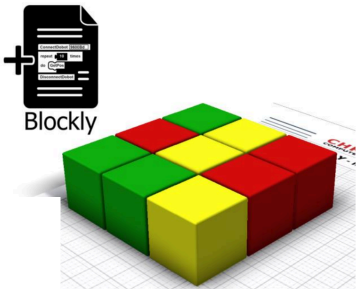
WARNING:

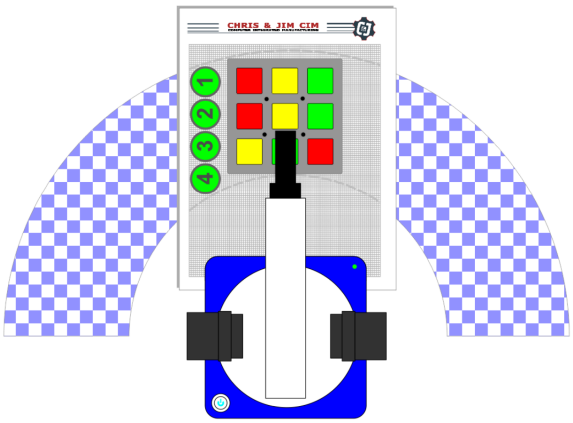
Caution: NEVER wire anything to the Dobot Magician while it has power on. ALWAYS shutdown the Dobot before making connections or damage to the robot could occur.

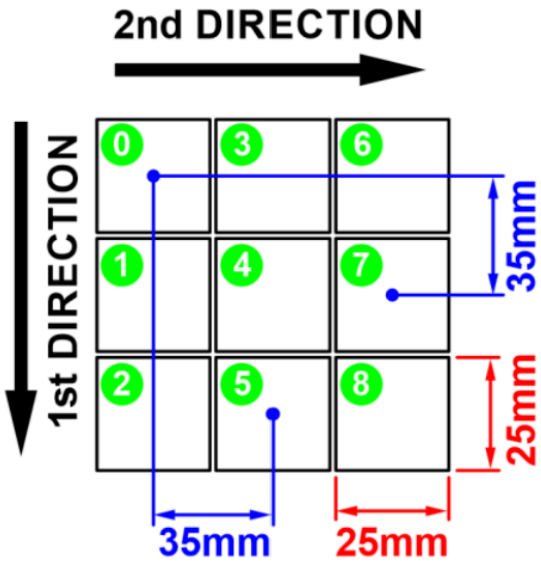
INTRODUCTION

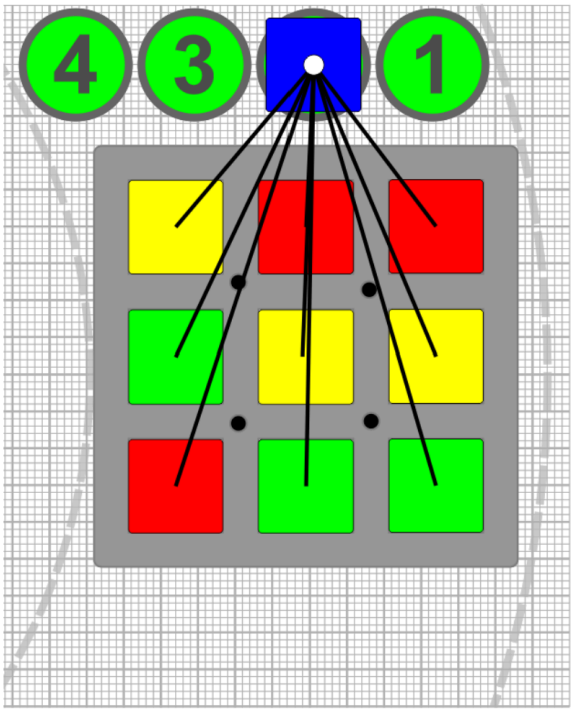
Matrices come in many different sizes throughout industry and can be used in other areas besides robotics. Many companies will use matrices in order to efficiently store products and materials, so it is important for you to know how they work and how to program one yourself. It is especially helpful for palletizing routines when placing boxes on a pallet efficiently.

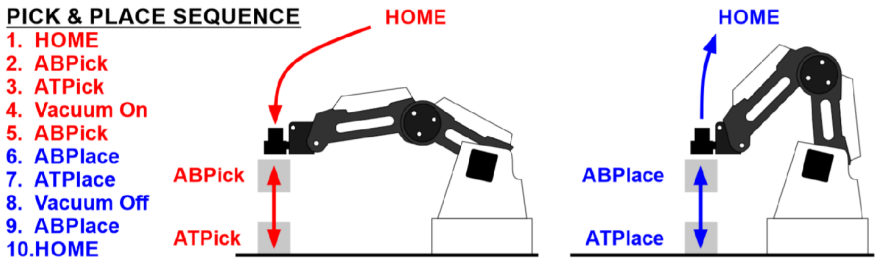










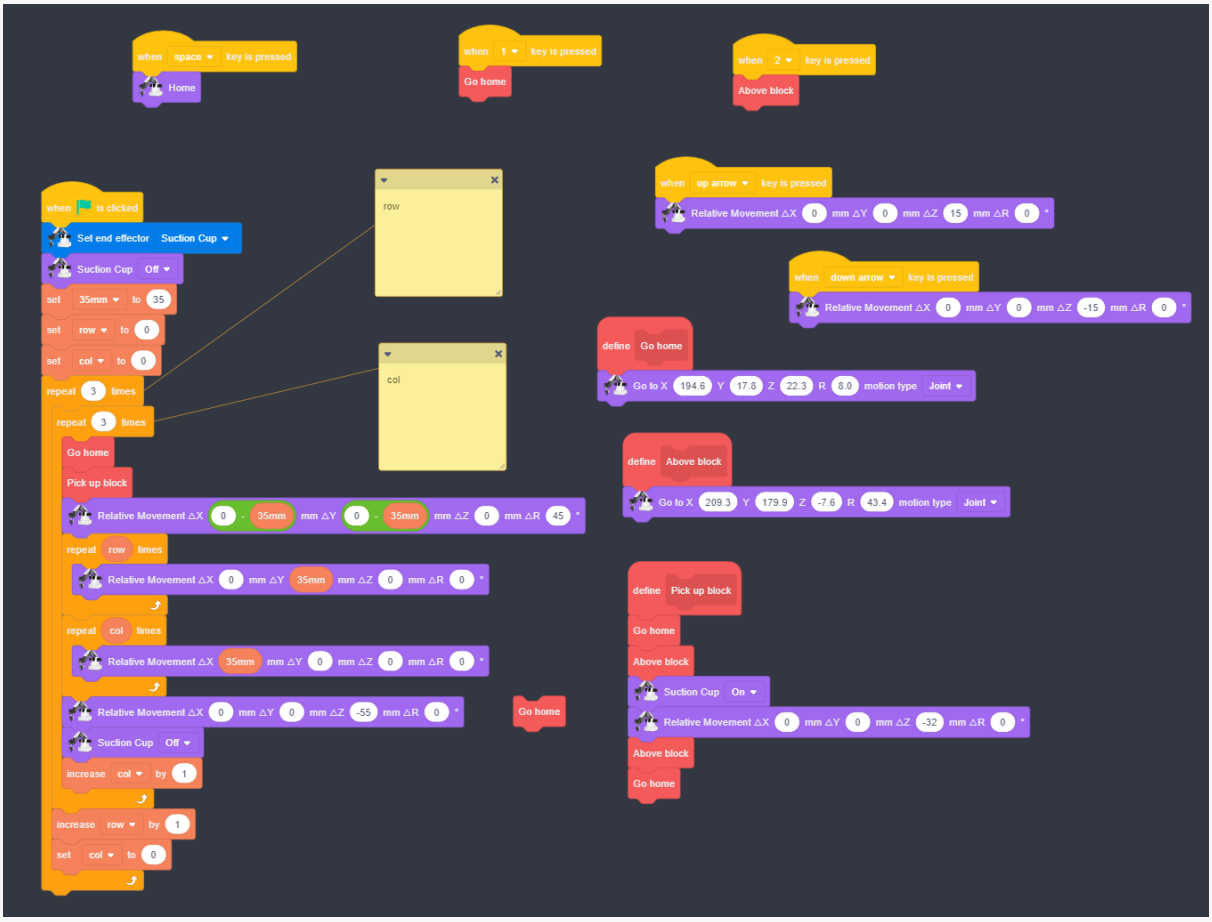


Complete the table below with all of the XYZ coordinates needed for all four blocks placed on the four corners.			
	X	Y	Z
1.Home	194.6	17.8	22.3
2.Above Pick (Position 11)	209.3	179.9	-7.6
3.At Pick (Position 1, RELATIVE)	0	0	-32
4. Move horizontal (relative)	0	35	0

5. Move vertical (relative)	35	0	0
6. Plunge (relative)	0	0	-55

Video of Pick and Place Routine
https://www.youtube.com/watch?v=jdUcir9-Rko

Screenshot of positions on the Dobot Software



If your set-up did not work correctly the first time, what did you have to do to make it work?

We had to add a condition after the first column to reset the variable to 0 otherwise it would try putting a block outside of the grid because it had accumulated the displacements

Conclusion

1. In your own words, define a variable.

A piece of modifiable information the computer stores to utilize at a later time.

2. In your own words, define a Function.

A series of instructions to execute when the function is called.

3. Explain what would have to be done to palletize two layers using bullet points or a step-by-step list below.

1. Go home
2. Set X, Y, Z to be the top-left corner of the grid for the first layer
3. Repeat two times
    a. Repeat three times
        i. Repeat three times
            1. Go home
            2. Grab block
            3. Go home
            4. Drop block at computed position
            5. Add +35mm to X
        ii. Remove -105mm from X
        iii. Add +35mm to Y
    b. Remove -105mm from Y
    c. Add +35mm to Z
4. Go home