**ClawBot – Program**

1) Build the ClawBot platform using the instructions on my website

2) Motor/sensor setup

 - 4 motors – 2 for propulsion, 1 for claw, 1 for claw arm

 - you will need a button switch and an encoder

3) Shaft Encoder

 - To calculate how far your vehicle will travel in one wheel rotation, you will need to calculate the circumference of your wheel first. To do this, use a dial caliper to get the diameter of the wheel. Multiply the diameter by PI (3.14). This is your circumference (in inches).

 - The encoder counts in degrees. One complete rotation of a drive shaft equals 360 degrees. When programming an encoder to turn a certain distance, you will need to calculate the number of degrees it will turn.

 - Example: A wheel has a diameter of 2.75”. Multiply by 3.14 to get a circumference of 8.635”. That means in 1 complete turn of the shaft (360 degrees), the wheel will travel 8.635”. So, 8.635” = 360 degrees. If your robot has to travel 3 feet (36 inches), then we need to convert that to degrees. Time for some algebra:

 8.635”/36” = 360/X

 X = (360 x 36”)/8.635”

 X = 1500.869 or round to 1501 degrees.

4) Programming

Use pseudocode to describe the different actions that your robot will have to perform. Use it throughout the program to describe chunks of your code.

 1) Travel 3 feet, raise arm, open the claw, return to start, lower arm and close claw

 2) Travel 3 feet, turn left, travel 1 ft., turn right, travel 2 ft., raise arm, open claw

 3) Travel 3 feet, pick up a cup, return to start and drop off cup

 4) Travel 3 feet, pick up paper ball, turn left, drop paper in trash can