

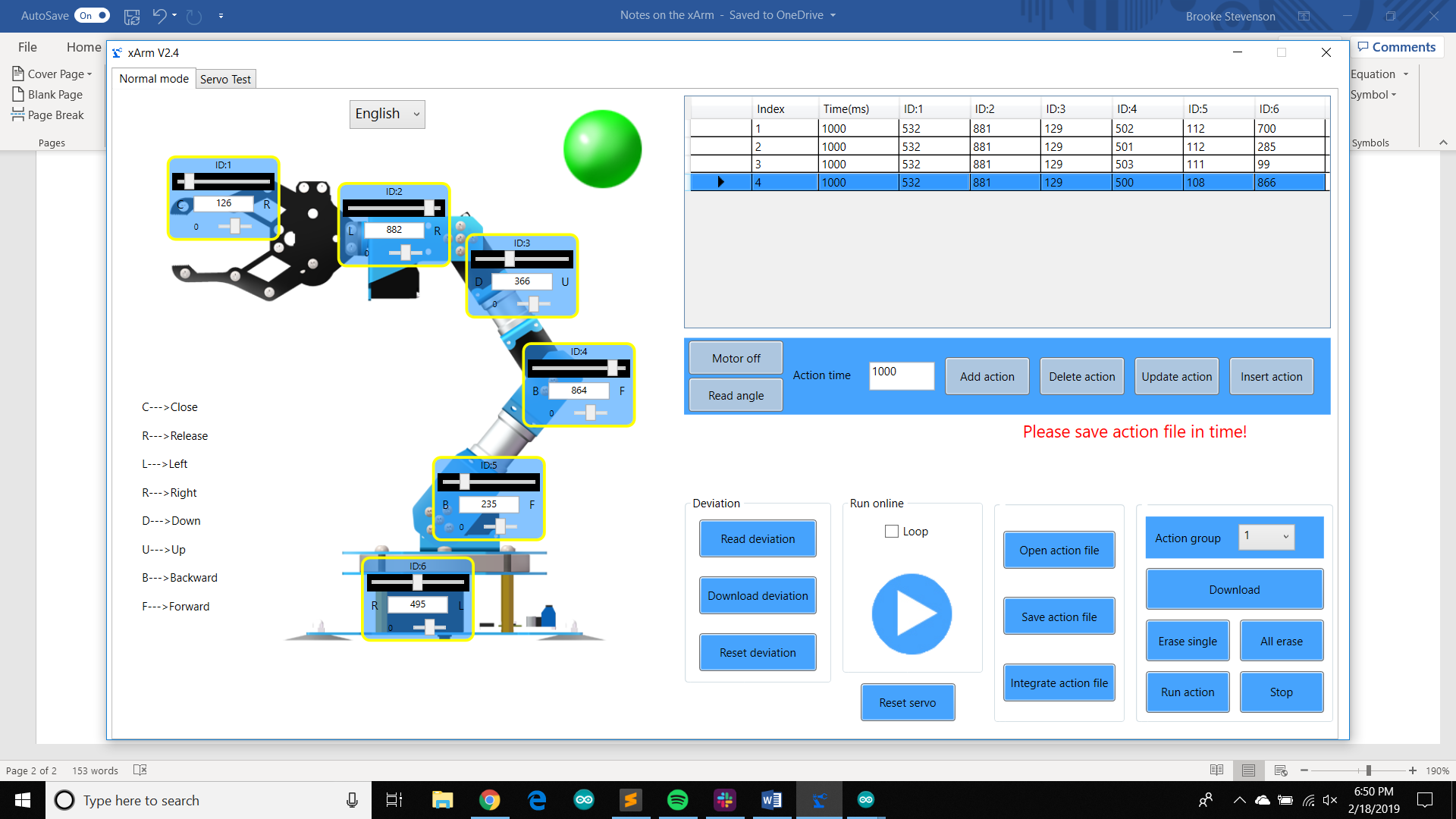
Highlighted is angle read when servo grasps the needle the action before it is the action to close all the way. This shows that it will read the actual angle and not just what is read. The first action tells the servo to open the claw as wide as possible and as close to the ground as possible. The second action stops slightly bigger than the width of the needle. (Action Group 1)

<https://maker.pro/raspberry-pi/tutorial/how-to-connect-and-interface-raspberry-pi-with-arduino>

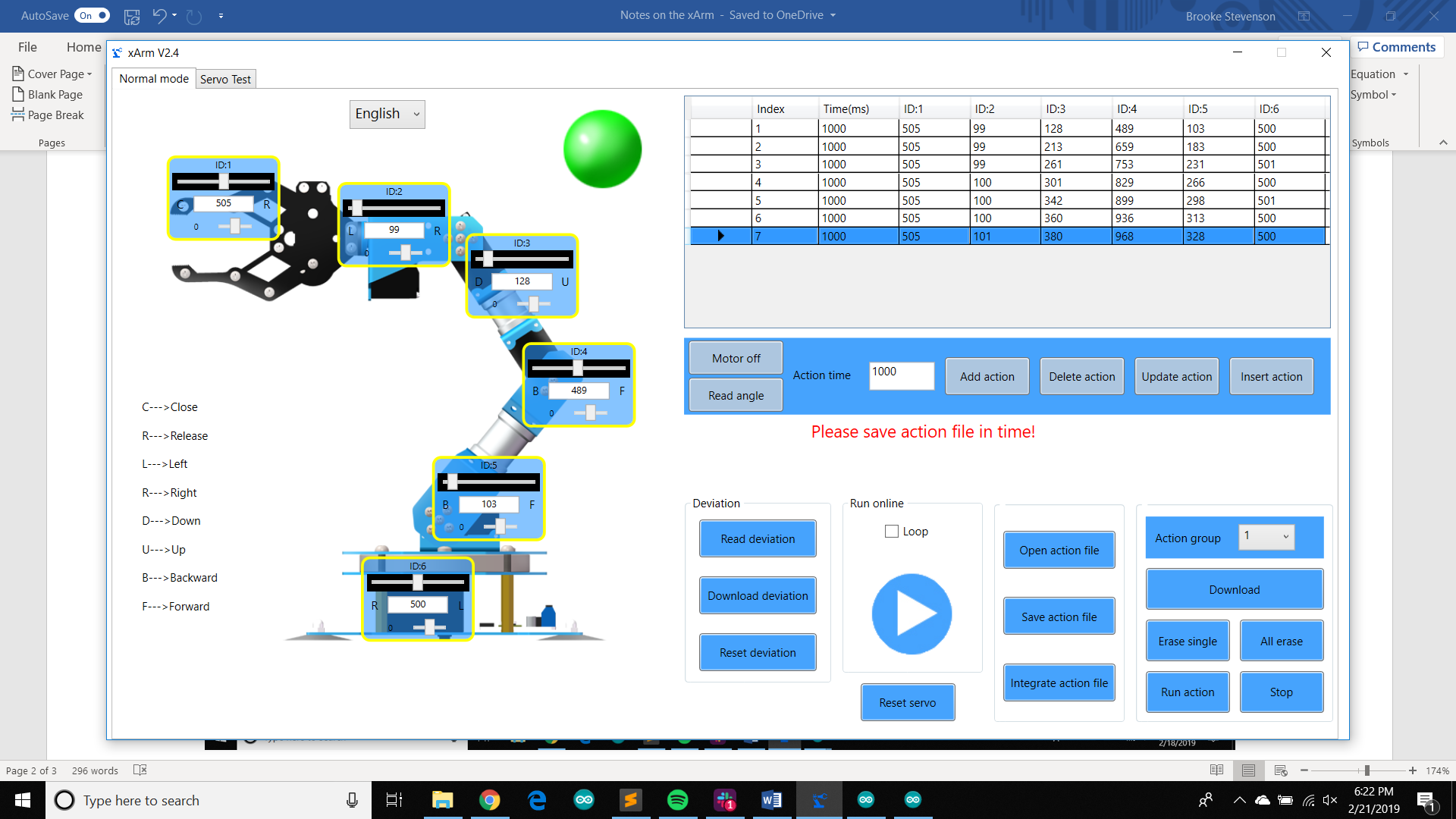
Serial1 needed for the RX and TX pins – 19(RX), 18(TX)



The first action is the max extension of the xArm with the narrow grip. The second action is the min extension of the xArm with the narrow grip. The third action is the max extension of the xArm with the wide grip. The fourth action is the min extension of the xArm with the wide grip. All actions were taken with the xArm going straight forward and straight back.



The first action is the xArm moved to the left in line with the front corner of the robot. The second action is the xArm moved to the right in line with the front corner of the robot. These should serve as reference for the max range of motion for the xArm to be able to safely be able to pick up a needle. The third action is the 0 point of the total range of motion for the xArm (a true semi-circle range), this is for the right side of the robot. The right side in reference to if you were looking at the robot from the back where the camera pole is. The fourth action is the 180 degree point for the total range of motion for the xArm (a true semi-circle range), this is the left side of the robot.



The first action is the xArm fully extended in front of the robot to achieve the max reach. The next actions are just slow movements of the xArm going towards the robot. The last action is the xArm is the minimum reach in front of the xArm.