```
In [141]:  from time import sleep
           import serial
```

Connects to the right serial port

Tries every serial port until it connects to the right one.

The following code blow is important for connecting the python script to the arduino.

```
In [94]:  ser = None
          connected = False
          for port in range(8):
              try:
                  ser = serial.Serial('/dev/ttyACM%d' % port, 9600) # Establis
          h the connection on a specific port
                  connected = True
                  print("Connected to device at /dev/ttyACM%d" % port)
                  break
              except:
                  continue
          if not connected:
              print("Failed to connect")
```

```
Connected to device at /dev/ttyACM4
```

Begin communication

Run the following code to initialize the serial connection key and ensure that it's connected.

```
In [95]:  KEY = b"$\r\n"
```

```
In [96]:  ser.write(KEY)
          instr = b""
          while instr != KEY:
              instr = ser.readline()
              print(instr)
```

```
b'\r\n'
b"Send a '$' to begin communication.\r\n"
b'Waiting for host....Found host.\r\n'
b'++++++++++++++++++++++++++\r\n'
b'Allda Prototyping System\r\n'
b'(c) 2021 Allda\r\n'
b'Authors: Zachary Pitcher and Catherine Zeng\r\n'
b'$\r\n'
```

Encoding Scheme

What the arduino reads is a string "C100050C200050C300050D000"

(written below with underscores so that it's easier to read)

C100050_C200050_C300050_D000

- The three "c1", "c2", "c3" describe the pressure from a scale of 0-15000 for each of the three channels
- The D figure describes the delay. ***This should not be lower than 15 or else the device may risk damage.***

The `MAX` and `MIN` variables denote the pressure range.

```
In [97]:  MAX = 15000
          MIN = 0
```

moveDildoPos

Moves the Dildo to a position

```
In [98]:  '''
          This function takes a vector tuple argument and optional delay argum
          ent and moves the dildo to that location.
          Example input:
          moveDildoPos((MAX, 0, 0), 25)
          '''
          def moveDildoPos(vector, delay=20):
              ch1, ch2, ch3 = vector

              channels_string = "C1%05d" % ch1
              channels_string += "C2%05d" % ch2
              channels_string += "C3%05d" % ch3

              delay_string = "D%03d" % delay

              code = channels_string + delay_string
              code += "\r\n"
              ser.write(str.encode(code))

              instr = b""
              result = ""

              while instr != KEY:
                  instr = ser.readline()
                  result += instr.decode("utf-8")

              return result
```

```
In [127]: def resetDildo():
              moveDildoPos((0, 0, 0), 30)
```

Test cases for move DildoPos

```
In [138]: # change your command here to see what happens
          moveDildoPos((0, 0, MAX), 30)

Out[138]: '$\r\n'
```

```
In [139]: resetDildo()
```

moveDildoDegree

For a set number of degrees, this will move the dildo to that degree location.

```
In [101]: POS_DICTIONARY = {
              "soft-center": (0, 0, 0),
              "hard-center": (MAX, MAX, MAX),
              0: (0, MAX, 0),
              30: (MAX, MAX, 0),
              60: (MAX, 0, 0),
              90: (MAX, 0, MAX),
              120: (0, 0, MAX),
              150: (0, MAX, MAX)
          }
```

```
In [102]: '''
          pos is an angle that's a multiple of 30 degrees.
          frequency is the number of taps that you want.
          delay is the delay in microseconds
          '''
          def moveDildoDegree(degree, delay=20):
              ch1, ch2, ch3 = POS_DICTIONARY[degree]

              channels_string = "C1%05d" % ch1
              channels_string += "C2%05d" % ch2
              channels_string += "C3%05d" % ch3

              delay_string = "D%03d" % delay

              code = channels_string + delay_string
              code += "\r\n"
              ser.write(str.encode(code))

              instr = b""
              result = ""

              while instr != KEY:
                  instr = ser.readline()
                  result += instr.decode("utf-8")

              return result
```

```
In [133]: def swingDildo():
              for i in {0, 30, 60, 90, 120, 150, 0}:
                  moveDildoDegree(i)
              resetDildo()
```

```
In [134]: moveDildoDegree(30)
```

```
Out[134]: '$\r\n'
```

```
In [135]: swingDildo()
```

Pulse

This will pulse the dildo, getting it hard and then soft for a number of times.

```
In [136]: def pulseDildo(pulseNumber):
              for i in range(pulseNumber):
                  moveDildoPos((0, 0, 0))
                  moveDildoPos((MAX, MAX, MAX))
              moveDildoPos((0, 0, 0))
```

```
In [137]: pulseDildo(5)
```