Team Number: Tues- 19

Please list full names and MacID's of all *present* Team Members

Full Name:	MacID:
Kyle McMaster	mcmask2
Abeka Selliah	selliaha
Sana Khan	khans288
Zhuohua Hu	huz80

MILESTONE 3 (STAGE 1) – PRELIMINARY SOLID MODEL (MODELLING SUB-TEAM)

Team Number: | Tues- 19

You should have already completed this task individually <u>prior</u> to Design Studio 9.

1. Copy-and-paste each team member's screenshots of their preliminary solid model on the following pages (1 team member per page)
    $\rightarrow$ Be sure to clearly indicate who each model belongs to

---

We are asking that you submit your work on both worksheets. It does seem redundant, but there are valid reasons for this:

- Each team member needs to submit their solid model screenshots with the **Milestone Three Individual Worksheets** document so that it can be ***graded***
- Compiling your individual work into this **Milestone Three Team Worksheets** document allows you to readily access your team member's work
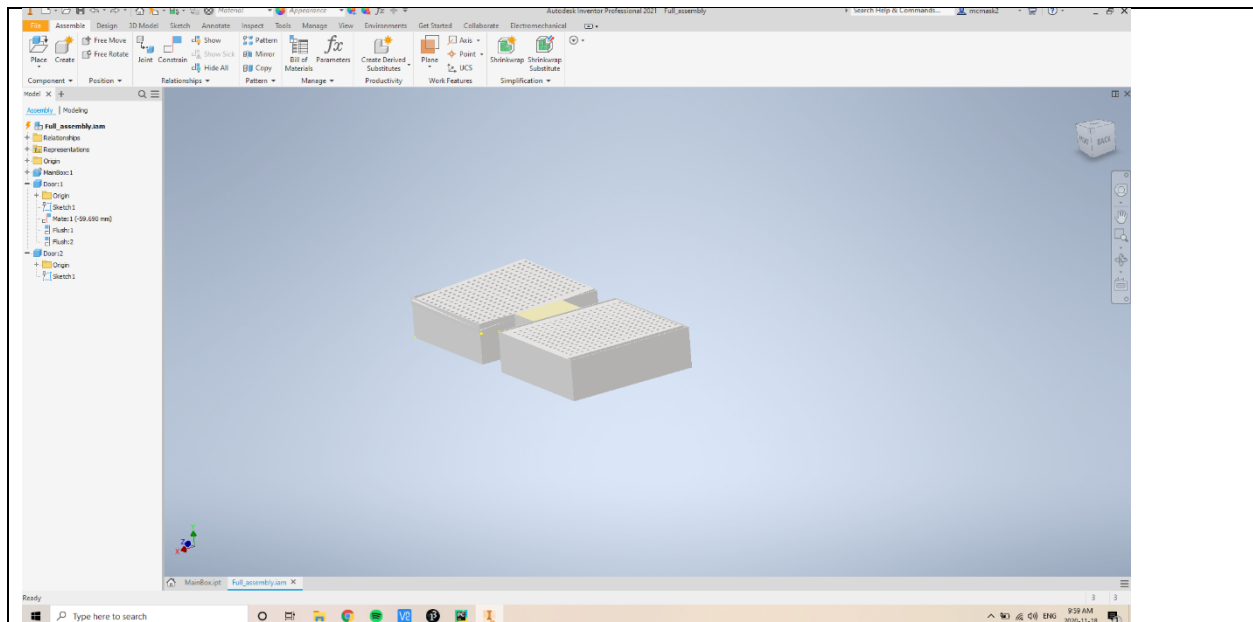   - o This will be especially helpful when completing ***Stage 3*** of the milestone

Name: Kyle McMaster	MacID mcmask2

Insert screenshot(s) of your model below
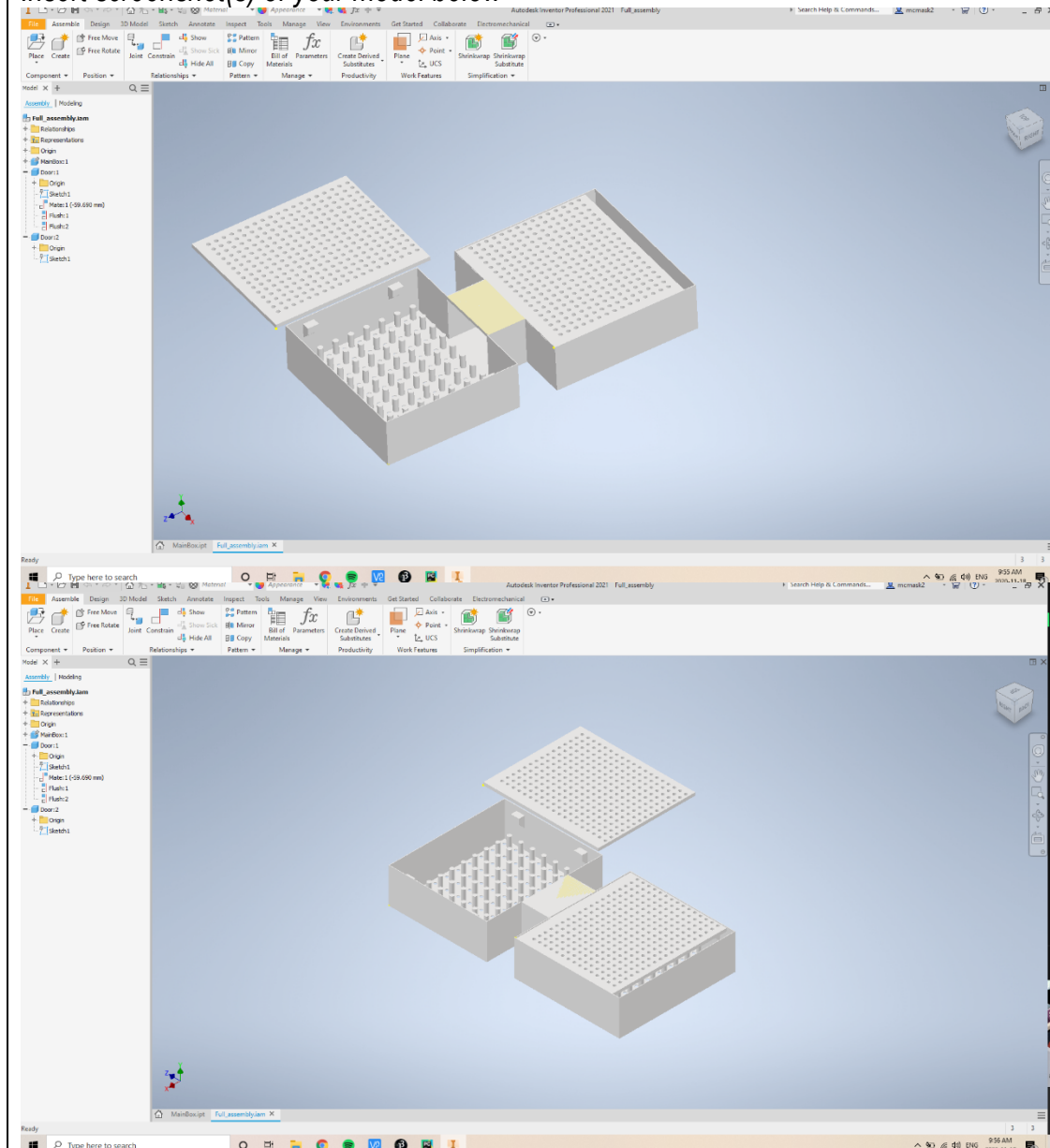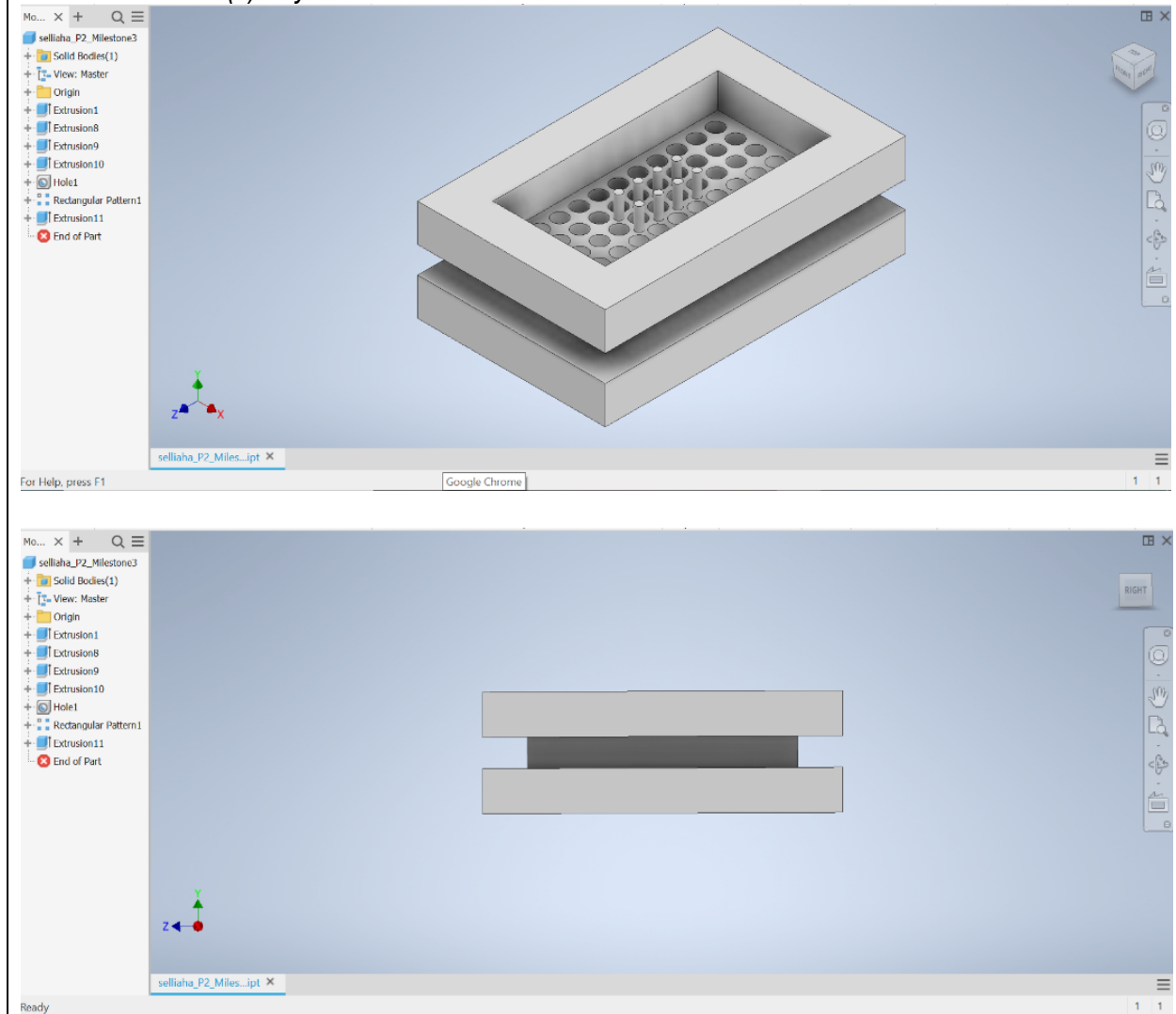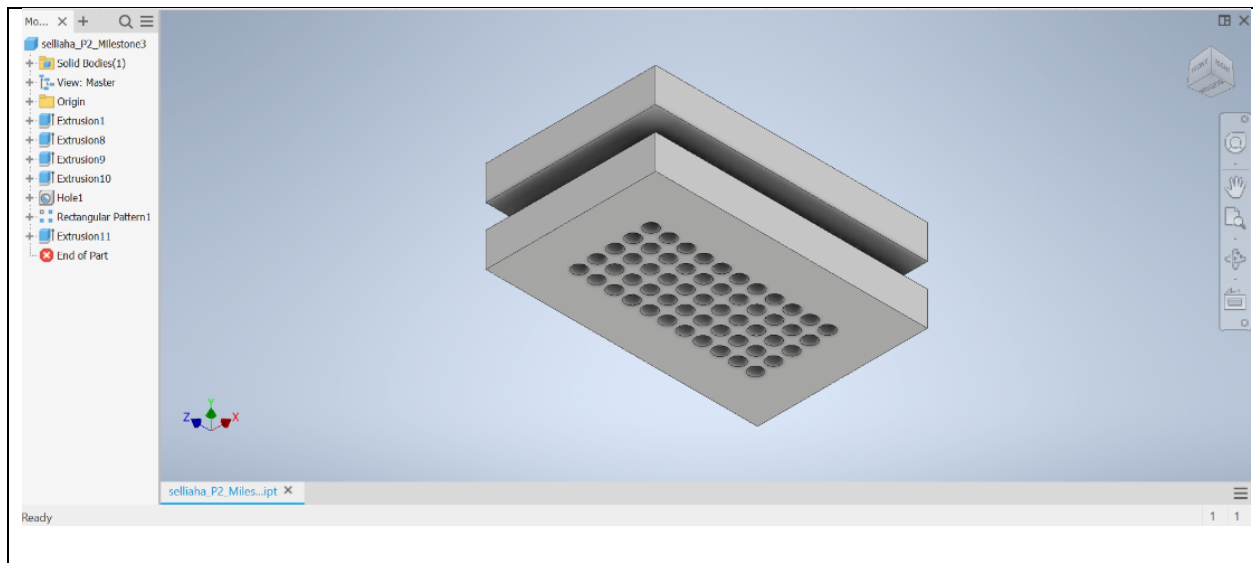
Name: Abeka Selliah	MacID: selliaha

Insert screenshot(s) of your model below

*If you are in a sub-team of 3, please copy and paste the above on a new page

MILESTONE 3 (STAGE 2) – PRELIMINARY PROGRAM TASKS (COMPUTATION SUB-TEAM)

Team Number: | Tues- 19 |

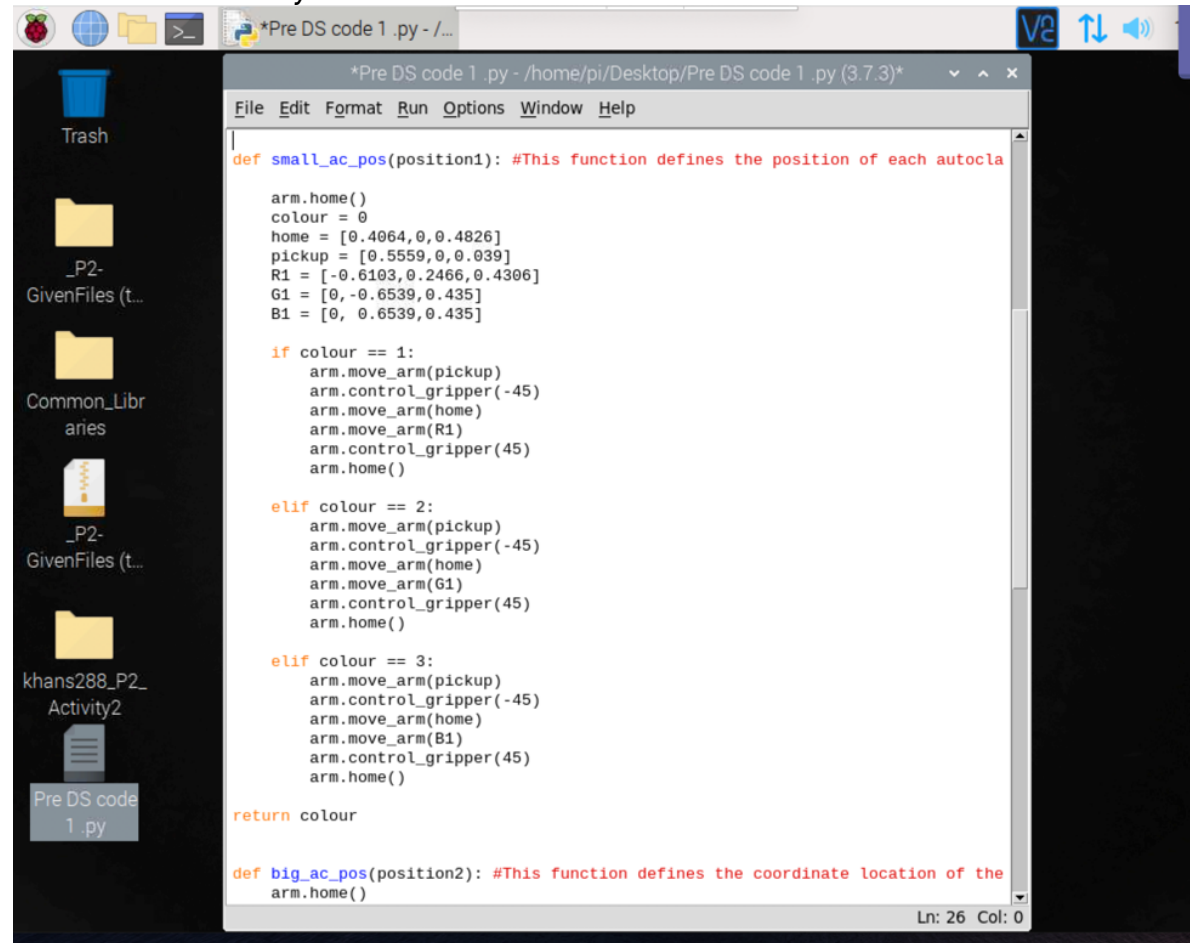You should have already completed this task individually <u>prior</u> to Design Studio 9.

1. Copy-and-paste each team member's code screenshots on the following pages (1 team member per page)
    $\rightarrow$ Be sure to clearly indicate who each code belongs to

---

We are asking that you submit your work on both worksheets. It does seem redundant, but there are valid reasons for this:
- Each team member needs to submit their code screenshots with the **Milestone Three Individual Worksheets** document so that it can be *graded*
- Compiling your individual work into this **Milestone Three Team Worksheets** document allows you to readily access your team member's work
    - This will be especially helpful when completing *Stage 4* of the milestone

| Name: Sana Khan | MacID khans288 |

Insert a screenshot of your code below


```python
def small_ac_pos(position1): #This function defines the position of each autocla

    arm.home()
    colour = 0
    home = [0.4064,0,0.4826]
    pickup = [0.5559,0,0.039]
    R1 = [-0.6103,0.2466,0.4306]
    G1 = [0,-0.6539,0.435]
    B1 = [0, 0.6539,0.435]

    if colour == 1:
        arm.move_arm(pickup)
        arm.control_gripper(-45)
        arm.move_arm(home)
        arm.move_arm(R1)
        arm.control_gripper(45)
        arm.home()

    elif colour == 2:
        arm.move_arm(pickup)
        arm.control_gripper(-45)
        arm.move_arm(home)
        arm.move_arm(G1)
        arm.control_gripper(45)
        arm.home()

    elif colour == 3:
        arm.move_arm(pickup)
        arm.control_gripper(-45)
        arm.move_arm(home)
        arm.move_arm(B1)
        arm.control_gripper(45)
        arm.home()

    return colour


def big_ac_pos(position2): #This function defines the coordinate location of the
    arm.home()
```

Ln: 26 Col: 0

Pre DS code 1 .py - /home/pi/Desktop/Pre DS code 1 .py (3.7.3)

File Edit Format Run Options Window Help

```python
def big_ac_pos(position2): #This function defines the coordinate location of the
    arm.home()
    colour = 0
    home = [0.4064,0,0.4826]
    pickup = [0.5559,0,0.039]
    R2 = [-0.4152,0.1511,0.2109]
    G2 = [0,-0.4647,0.1557]
    B2 = [0, 0.4647,0.1557]

    if colour == 1:
        arm.open_red_autoclave(True)
        arm.move_arm(pickup)
        arm.control_gripper(-45)
        arm.move_arm(home)
        arm.move_arm(R2)
        arm.control_gripper(45)
        arm.home()
        arm.open_red_autoclave(False)

    elif colour == 2:
        arm.open_green_autoclave(True)
        arm.move_arm(pickup)
        arm.control_gripper(-45)
        arm.move_arm(home)
        arm.move_arm(G2)
        arm.control_gripper(45)
        arm.home()
        arm.open_green_autoclave(False)

    elif colour == 3:
        arm.open_blue_autoclave(True)
        arm.move_arm(pickup)
        arm.control_gripper(-45)
        arm.move_arm(home)
        arm.move_arm(B2)
        arm.control_gripper(45)
        arm.home()
        arm.open_blue_autoclave(False)

    return colour
```

Ln: 26 Col: 0

Trash

_P2-GivenFiles (t...

Common_Libraries

_P2-GivenFiles (t...

khans288_P2_Activity2

Pre DS code 1 .py

Name:Zhuohua Hu | MacID: huz80

Insert a screenshot of your code below

```
## ---------------------------------------------------------------------------------------------------
## TEMPLATE
## Please DO NOT change the naming convention within this template. Some changes may
## lead to your program not functioning as intended.

import sys
sys.path.append('../')

from Common_Libraries.p2_lib import *

import os
from Common_Libraries.repeating_timer_lib import repeating_timer

def update_sim ():
    try:
        arm.ping()
    except Exception as error_update_sim:
        print (error_update_sim)

arm = qarm()

update_thread = repeating_timer(2, update_sim)


## STUDENT CODE BEGINS
## ---------------------------------------------------------------------------------------------------
## Example to rotate the base: arm.rotateBase(90)
def arm_movement(left_arm, right_arm):
    tool_box = ["1", "2", "3", "4", "5", "6"]
    x = randint(0,1)
    left_arm = arm.emg_left(x)
    right_arm = arm.emg_right(x)
    for i in range(len(tool_box)):
        if x <= 0.5:
            left_arm and right_arm
            claw_move = arm.control_gripper(22.5)
        else:
            left_arm and right_arm
            claw_move = arm.control_gripper(45)
    return claw_move
```

*If you are in a sub-team of 3, please copy and paste the above on a new page

MILESTONE 3 (STAGE 3) – PUGH MATRIX (MODELLING SUB-TEAM)

Team Number: | Tues- 19

1. As a team, evaluate your designs for the sterilization container in the table below
    → List your Criteria in the first column
        • You should include a minimum of 5 criteria
    → Fill out the table below, comparing your designs against the given baseline
        • Replace "Design A" and "Design B" with more descriptive labels (e.g., a distinguishing feature or the name of the student author)
        • Assign the datum as the baseline for comparison
        • Indicate a "+" if a concept is better than the baseline, a "–" if a concept is worse, or a "S" if a concept is the same

	Datum	Two sections with indent (Kyle)	Brick design (Abeka)
Easy to pick up/ transport	S	+	+
Effectively secures tools	S	_	_
Ability for vapour to flow	S	S	S
Durability	S	-	+
Secure Lid	S	-	-
Lightweight	S	S	-
Ease of manufacturing	S	+	+
Total +		2	3
Total –		3	3
Total Score		-1	0

*For a team of 3, click the top-right corner of the table to "Add a New Column"

2. Propose one or more suggested design refinements moving forward

- New design must fit in footprint****
- Sticks with pegs
    - Shape them to tool
- Better ventilation
- Hinge for lid
- Remove indentations and add a smaller "hole" for gripper to securely grab container

MILESTONE 3 (STAGE 4A) – CODE PEER-REVIEW (COMPUTATION SUB-TEAM)

Team Number: Tues- 19

Document any errors and/or observations for each team member's preliminary Python program in the space below

Identify Autoclave Bin Location Task	Team Member Name: Sana Khan
Enter code errors and/or observations here -There were errors in the return statement -After fixing the return statement there were no errors, but the program did not do anything -Code was a little bit redundant and repetitive so we will make a separate function for the actual movement of the arm and call on that function once the robot recognizes the size and colour of the container	
Move End-Effector Task	**Team Member Name**: Zhuohua Hu
Enter code errors and/or observations here - The return statement had an extra indent - The range of the for loop was inaccurate - the values in the list were not integers and it did not work in the for loop	

Team Number: | Tues- 19

As a team, write out the pseudocode for each of the *remaining* tasks in your computer program in the space below.

Control Gripper

- If the emg sensor for the right arm is <= 0.5 the anle of the claw is < 45 degrees
- If the emg sensor for the left arm is <=0.5 the angle of the claw is < 45 degrees
- If the emg sensor for the left and right arm is > 0.5
  - the claw closes with 45 degree angle

Open Autoclave Bin Drawer

- Check if the box is the large box
  - If it is check, the colour corresponding to numbers 4,5, and 6
    - Open the drawer of the corresponding colour of the box

Continue or Terminate

- Loop through the main function six times until there are no more boxes left at the pickup platform and all boxes have reached their drop off location
  - End the function and return to home position