

PROJECT TWO: MILESTONE 3 – COVER PAGE

Team Number:

Tues-28

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

Full Name:	MacID:
Julian Cecchini	cecchinj
Luke West	westl5
Luigi Quattrociocchi	quattrl
Hetash Rattu	rattuh

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

Team Number: Tues-28

You should have already completed this task individually prior 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)
 - Be sure to clearly indicate who each model belongs to

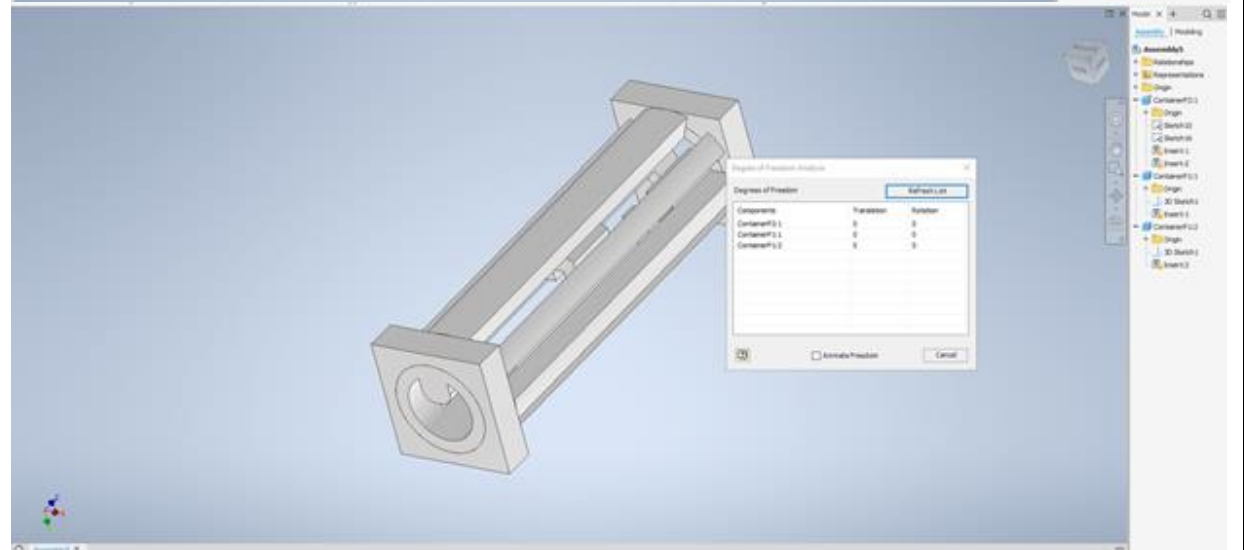
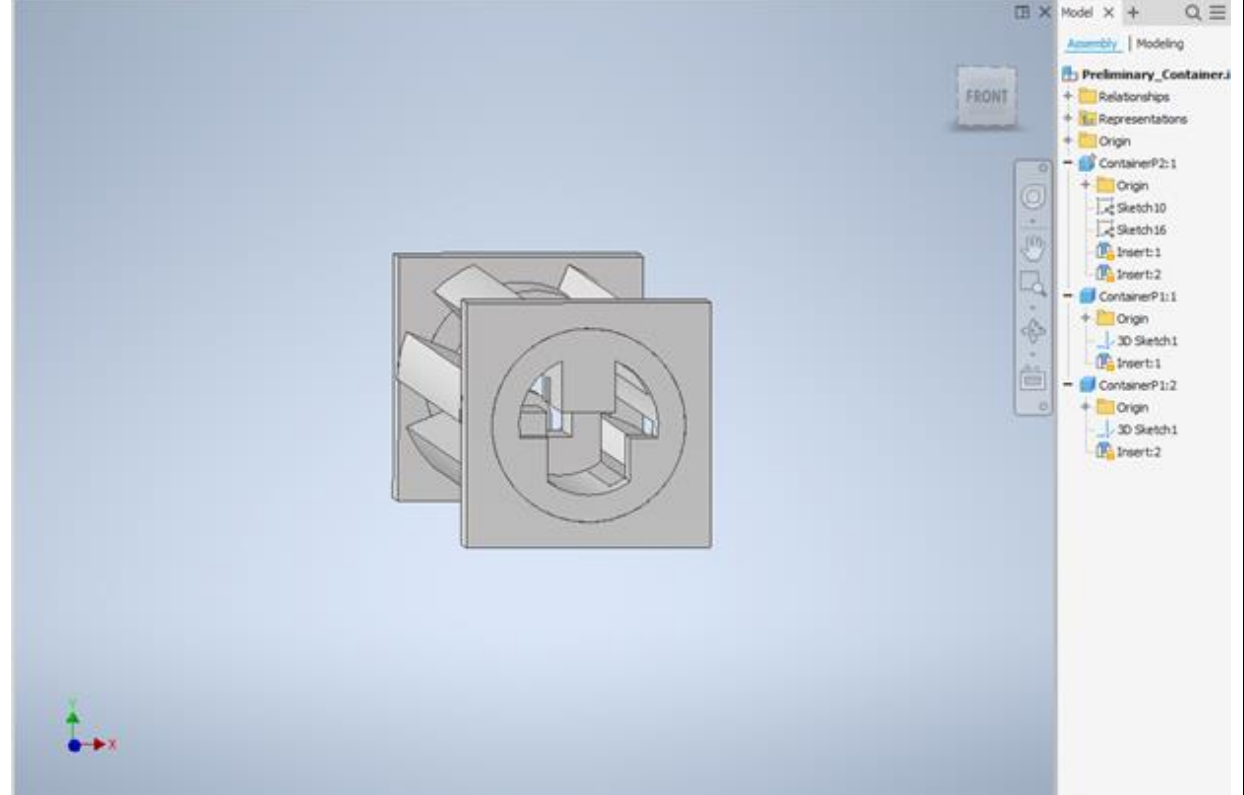
We are asking that you submit your work on both worksheets. It does seem redundant, but there are valid reasons for this:

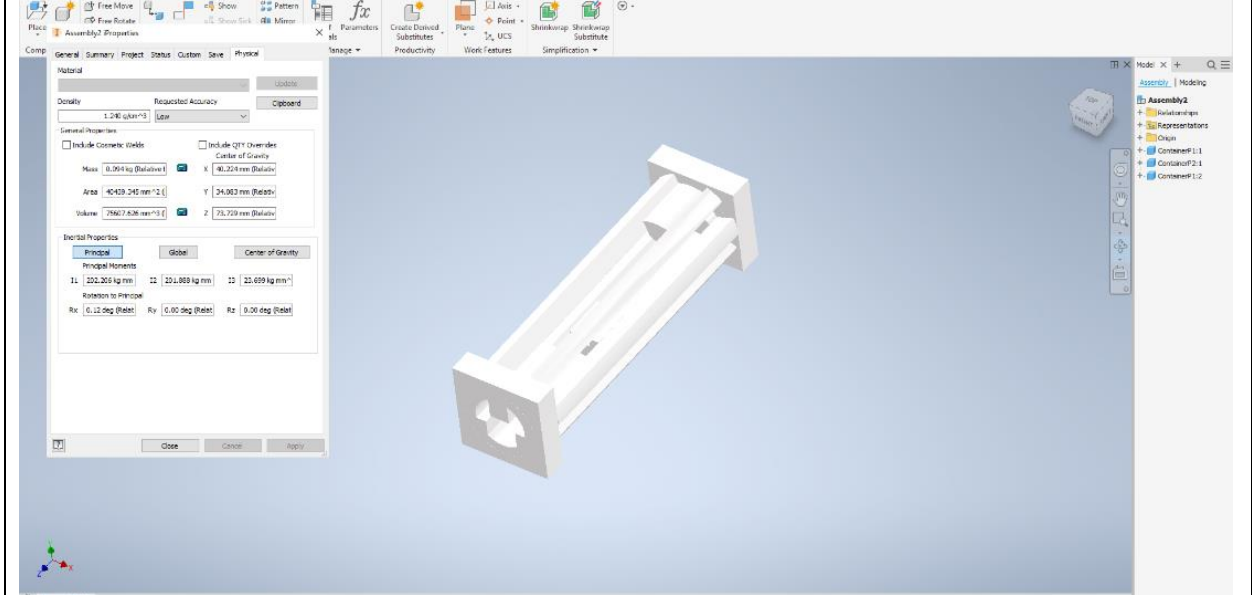
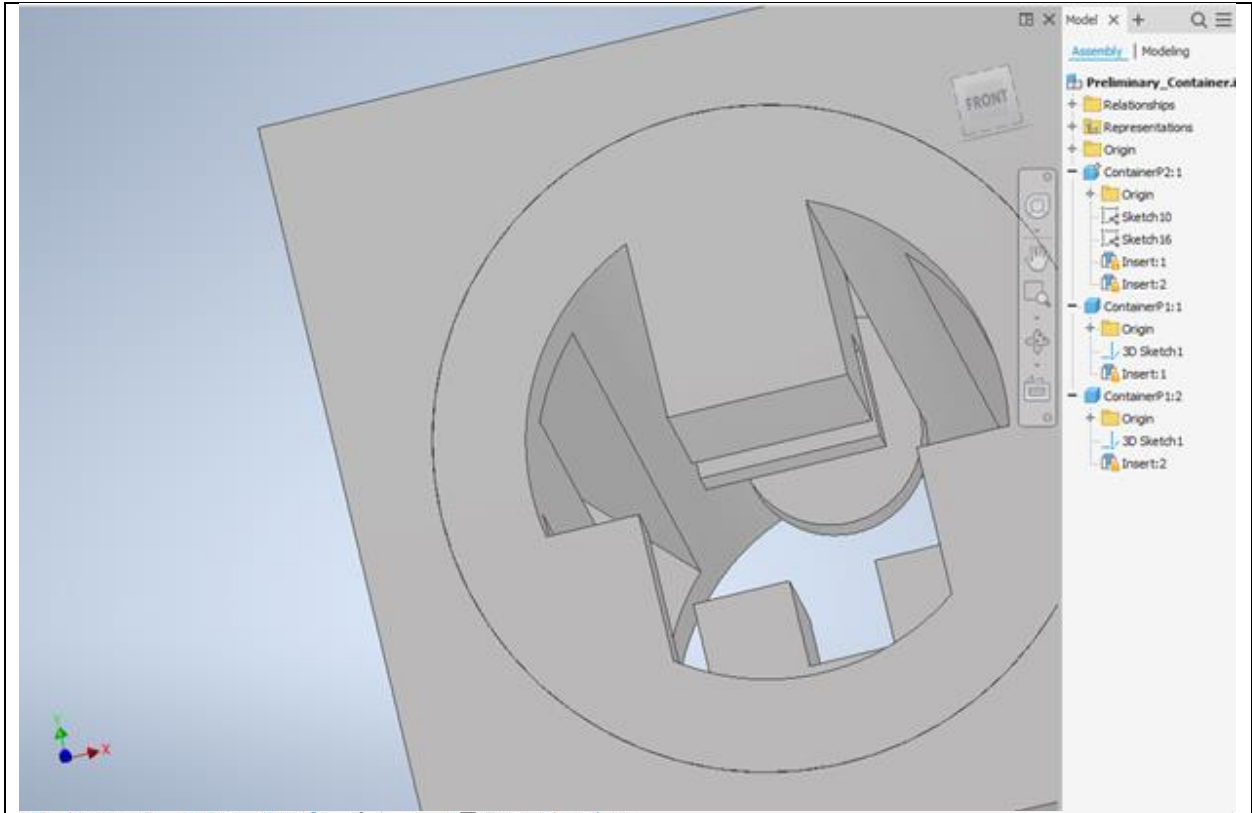
- Each team member needs to submit their solid model screenshots with the **Milestone Three Individual Worksheets** document so that it can be *graded*
- Compiling your individual work into this **Milestone Three Team Worksheets** document allows you to readily access your team member's work
 - This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

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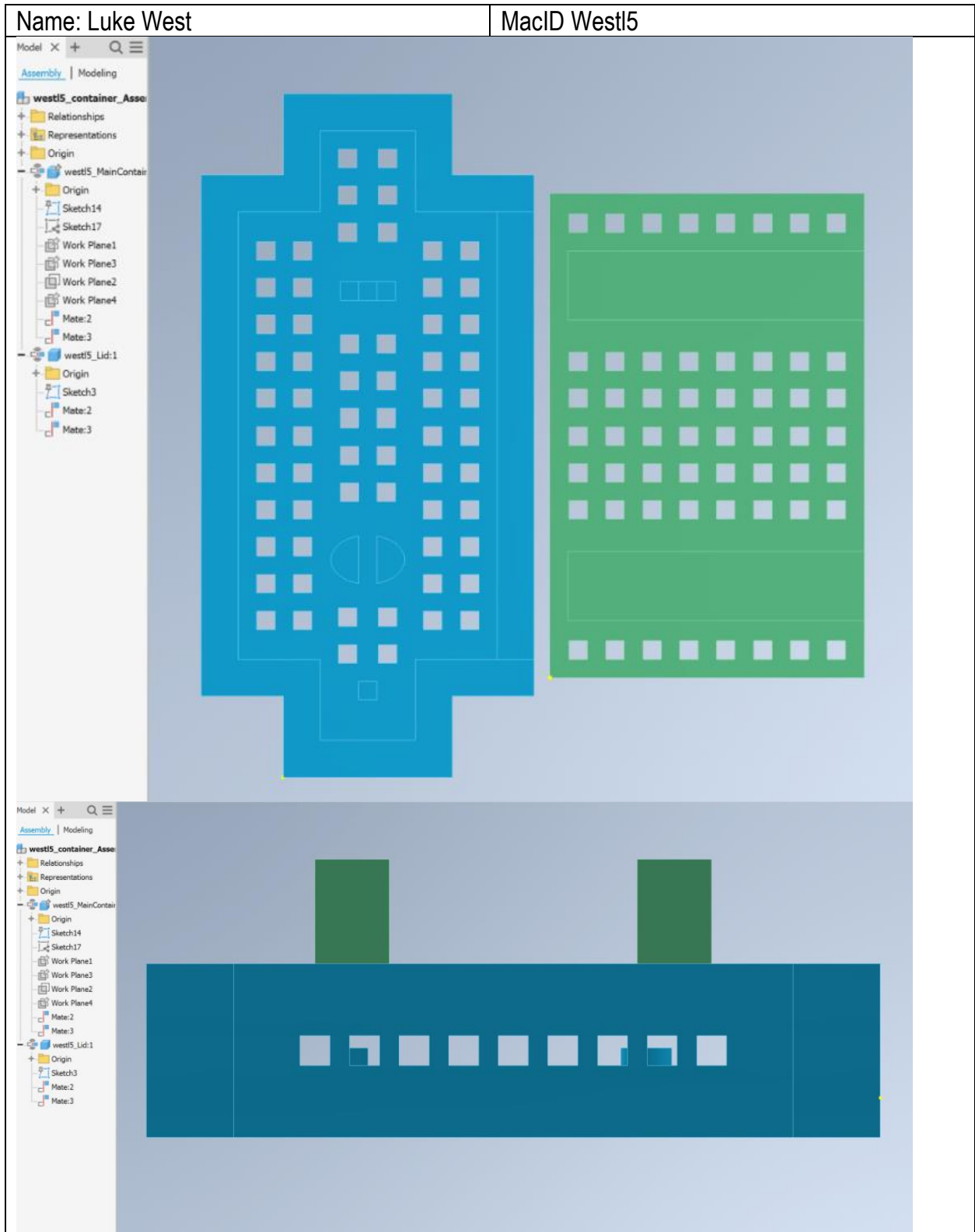
Name: Julian Cecchini

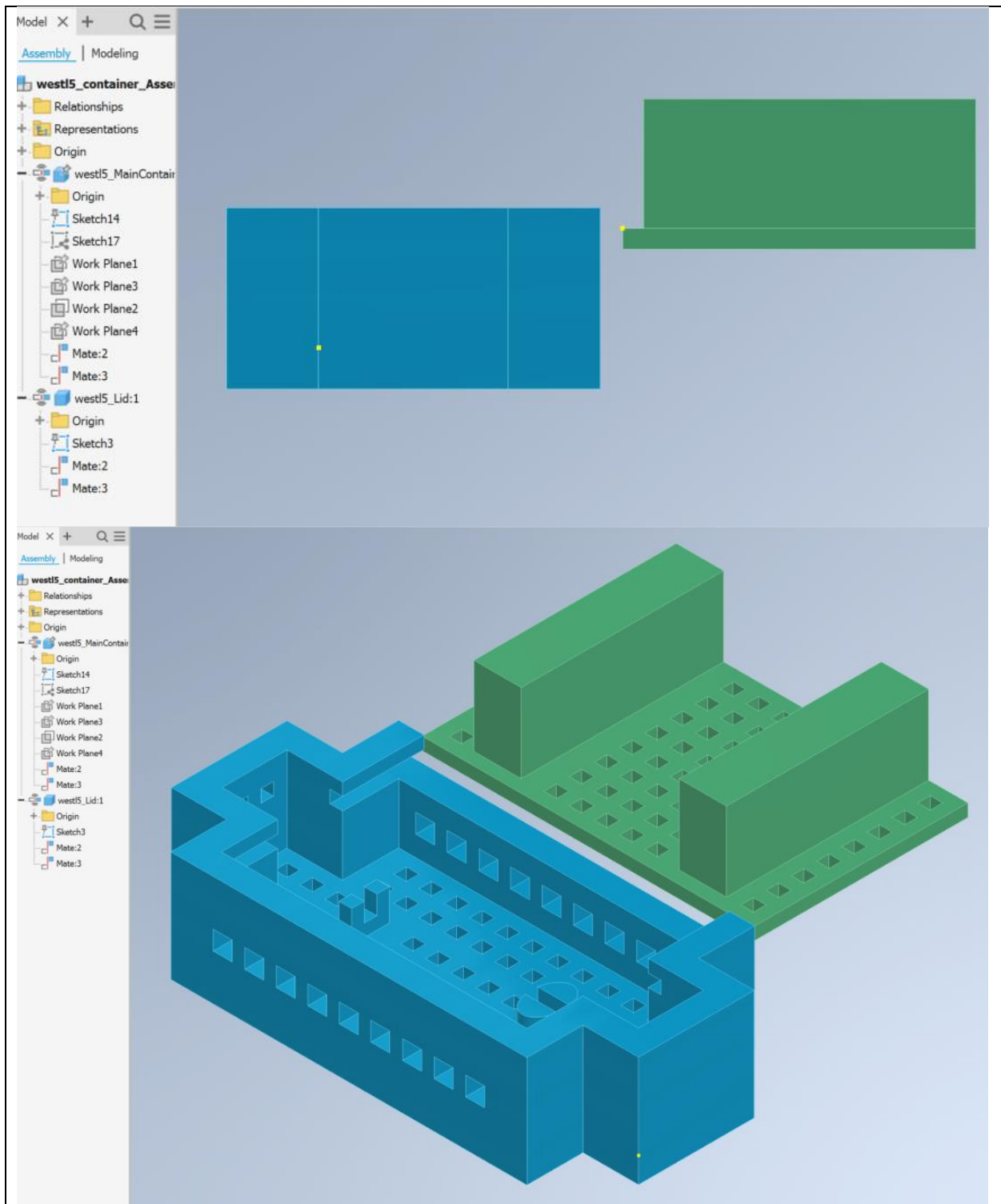
MacID: cecchinj





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*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-28

You should have already completed this task individually prior to Design Studio 9.

1. Copy-and-paste each team member's code screenshots on the following pages (1 team member per page)
 - 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: Luigi Quattrociochi

MacID: quattrl

```
def identify_autoclave_bin_location(container_id):
    """
    Returns a list with 3 elements describing x, y, z coordinates of the
    location of an autoclave bin that corresponds to the given id

    >>> identify_autoclave_bin_location(1)
    [-0.6099, 0.2464, 0.3784]
    >>> identify_autoclave_bin_location(0)
    [0.4064, 0.0, 0.4826]
    """

    if container_id == 1: # small red
        return [-0.6099, 0.2464, 0.3784]
    if container_id == 2: # small green
        return [0.0, -0.6578, 0.3784]
    if container_id == 3: # small blue
        return [0.0, 0.6578, 0.3784]
    if container_id == 4: # large red
        return [-0.394, 0.1592, 0.2374]
    if container_id == 5: # large green
        return [0.0, -0.4249, 0.2374]
    if container_id == 6: # large blue
        return [0.0, 0.4249, 0.2374]

    # base case home position
    return [0.4064, 0.0, 0.4826]
```


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Name: Hetash Rattu	MacID rattuh
<pre style="background-color: #f0f0f0; border: 1px solid #ccc; padding: 10px;">In []: def moveeffector (): if arm >= thres arm.move_arm(0,0,0) #starting position time.sleep(2) arm.move() #move to the given position time.sleep(2)</pre>	

*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-28

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 - Standard Box	Sliding Lid Design	Barrel Design
<i>Sterilization</i>	S	S	S
<i>Stabilization</i>	S	S	-
<i>Rigidity</i>	S	-	S
<i>Mass</i>	S	S	S
<i>Complexity/ Printability</i>	S	-	-
<i>Ability to grip</i>	S	+	S
Total +	0	1	2
Total -	0	2	0
Total Score	0	-1	-2

*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

<p>Julian: barrel design</p> <ul style="list-style-type: none"> • Adjust design for securing the tool to ensure it will not fall out after excessive shaking • Reduce complexity of internal parts by reducing overhangs and/or total number of parts for the sake of the 3D printer process. • Make container easier for effector to latch onto (original intention was barrel but upon examination it may be too small, therefore, the rectangular prisms will likely be given that purpose instead) • Possibly adjust dimensions so it is more spacious in autoclave <p>Luke: sliding lid design</p> <ul style="list-style-type: none"> • Add thickness to lid for strength/structural integrity
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- Make more room so that the sliding mechanism fits less snug within the groove and leaves more room for printer error.
- Reinforce part where robot grips the lid/container in order to keep it rigid under the force of the gripper
- Possibly resize so it completely fits in autoclave without protruding upward

Note: Decide final design concept before wk-10.

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

Team Number: Tues-28

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: Luigi Quattrociochi
There were no error found in the code. Code worked in the Q-labs environment There are comments that relate the bin number to the colour and size If statements could be replaced with elif statements Locations may not be exactly correct and may need to be modified	
Move End-Effector Task	Team Member Name: Hetash Rattu
<ul style="list-style-type: none">• Code would not compile:<ul style="list-style-type: none">○ Missing colon after if statement○ Missing indentation after if statement○ arm does not have a move() method○ thres is not defined• function should take parameters for x, y, z coordinates• arm should move to specified location• arm >= thres is not a valid comparison (object to number)• should use arm.emg_left() or arm.emg_right() methods• 0, 0, 0 is not the exact home position• a few short comments	

MILESTONE 3 (STAGE 4B) – PROGRAM TASK PSEUDOCODE (COMPUTATION SUB-TEAM)

Team Number: Tues-28

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

Control Gripper

Define threshold value

Define Control Gripper function with open or close flag passed in

Begin indefinite loop

 Check muscle sensor values

 Wait until right arm is flexed (above threshold) and the left arm is fully extended

 Fully open or close the fingers of the gripper (based on flag)

 Break out of indefinite loop

Open Autoclave Bin Drawer

Define threshold value

Define Open Autoclave Bin Drawer function with open or close flag and container id

If container is large

 Begin indefinite loop

 Wait until both arms are flexed

 Decide which drawer to open based on container color (red, green, or blue respectively)

 Open or close the corresponding colored autoclave drawer based on the flag

 Break out of indefinite loop

Continue or Terminate

Track all containers which have not been placed yet using a list

Loop while all containers have not been successfully placed in their correct autoclave bins yet (list is not empty)

 Choose a random container to place next

 Pick up and place the next container in its correct autoclave bin

 Remove placed container from "containers that have not been placed" list

Once loop is finished, terminate the program