PROJECT THREE: MILESTONE 3 – COVER PAGE

Team Number: Tues-26

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

Full Name:	MacID:
Sana Khan	khans288
Yash Patel	pately28
Amine Hassine	hassinem
Ahmed Mohamed	mohaa97

MILESTONE 3 (STAGE 1A) – WORKFLOW PSEUDOCODE (COMPUTATION SUB-TEAM)

Team Number: Tues-26

You should have already completed this task individually *prior* to Design Studio 15.

1. Write out a pseudocode outlining the *high-level workflow* of your computer program on the following page
   → Only one team member is responsible for this task (not *both*)
   → 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 pseudocode 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

Team Number: Tues-26

Name: Yash Patel	MacID: pately28

*Write out a pseudocode outlining the **high-level workflow** of your computer program in the space below.*

This program will allow for containers to be transferred from the sorting station to the recycling station.

```
Determine bin_id function:
    Determine container attributes
    Material = ----
    Mass = -----

    If material = ----- and Mass = ------:
        recycling_bin = bin_id
        rotate sorting station for Q-arm to pickup

     return recycling_bin

Main function:
    While True:
      Bin_id = Determine_bin_id()
      Rotate sorting station
      Bin_id2 = Determine_bin_id()
      Rotate sorting station

      While num_container < 3 or mass_Qbot < 90 or bin_id = bin_id2:
        Q arm moves adjacent to container
        Q arm closes gripper
        Q arm moves container to hopper
        Q arm opens gripper
        Return Q arm to home position
```

```
If bin_id = ###:
  color = ####

 Qbot starts moving
 Sensor on Q-bot is activated
 If sensor_color = ###
   Stop_Q-bot
   Move Q-bot to bin
   Rotate hopper to drop containers into bin
   Return q-bot to home
```

MILESTONE 3 (STAGE 1B) – WORKFLOW FLOWCHART / STORYBOARD (COMPUTATION SUB-TEAM)

Team Number: Tues-26

You should have already completed this task individually *prior* to Design Studio 15.

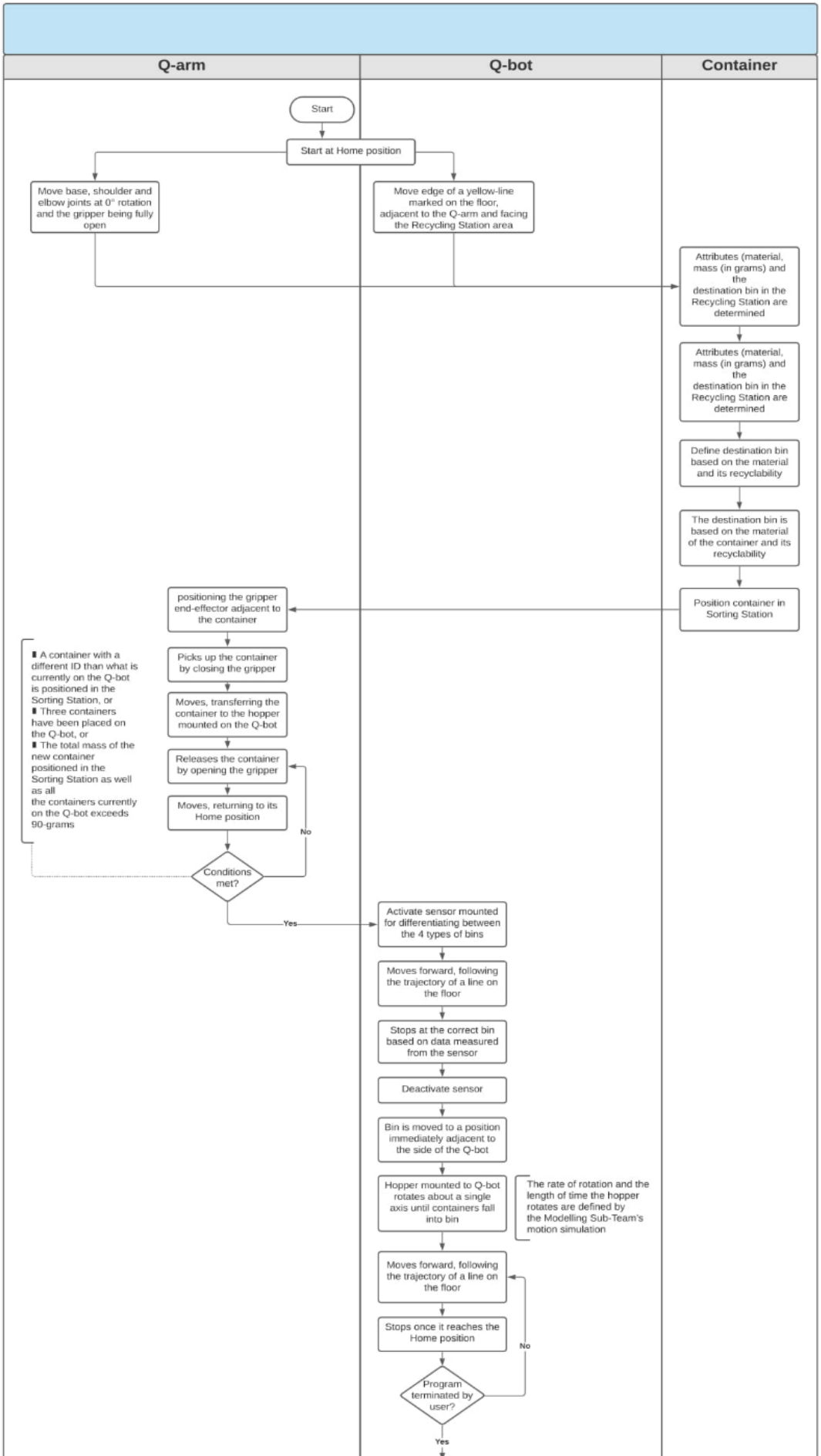
1. Only one team member is responsible for this task (not *both*)
2. Copy-and-paste your flowchart or storyboard on the following page
   → Be sure to include your Team Number, Name and MacID
3. Take a photo of your flowchart / storyboard
4. Insert your photo as a Picture (Insert > Picture > This Device)

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 flowchart/storyboard 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

Team Number: Tues-26

Name: Ahmed Mohamed	MacID mohaa97


Q-arm
Q-bot
Container
Start
Start at Home position
Move base, shoulder and elbow joints at 0° rotation and the gripper being fully open
Move edge of a yellow-line marked on the floor, adjacent to the Q-arm and facing the Recycling Station area
Attributes (material, mass (in grams) and the destination bin in the Recycling Station are determined
Attributes (material, mass (in grams) and the destination bin in the Recycling Station are determined
Define destination bin based on the material and its recyclability
The destination bin is based on the material of the container and its recyclability
Position container in Sorting Station
positioning the gripper end-effector adjacent to the container
Picks up the container by closing the gripper
Moves, transferring the container to the hopper mounted on the Q-bot
Releases the container by opening the gripper
Moves, returning to its Home position
A container with a different ID than what is currently on the Q-bot is positioned in the Sorting Station, or
Three containers have been placed on the Q-bot, or
The total mass of the new container positioned in the Sorting Station as well as all the containers currently on the Q-bot exceeds 90-grams
No
Conditions met?
Yes
Activate sensor mounted for differentiating between the 4 types of bins
Moves forward, following the trajectory of a line on the floor
Stops at the correct bin based on data measured from the sensor
Deactivate sensor
Bin is moved to a position immediately adjacent to the side of the Q-bot
Hopper mounted to Q-bot rotates about a single axis until containers fall into bin
The rate of rotation and the length of time the hopper rotates are defined by the Modelling Sub-Team's motion simulation
Moves forward, following the trajectory of a line on the floor
Stops once it reaches the Home position
No
Program terminated by user?
Yes

MILESTONE 3 (STAGE 2) – DETAILED SKETCHES (MODELLING SUB-TEAM)

Team Number: Tues-26

You should have already completed this task individually *prior* to Design Studio 15.

1. Copy-and-paste each sub-team member's detailed sketch on the following pages (1 sketch per page)
   → Be sure to indicate each team member's Name and MacID

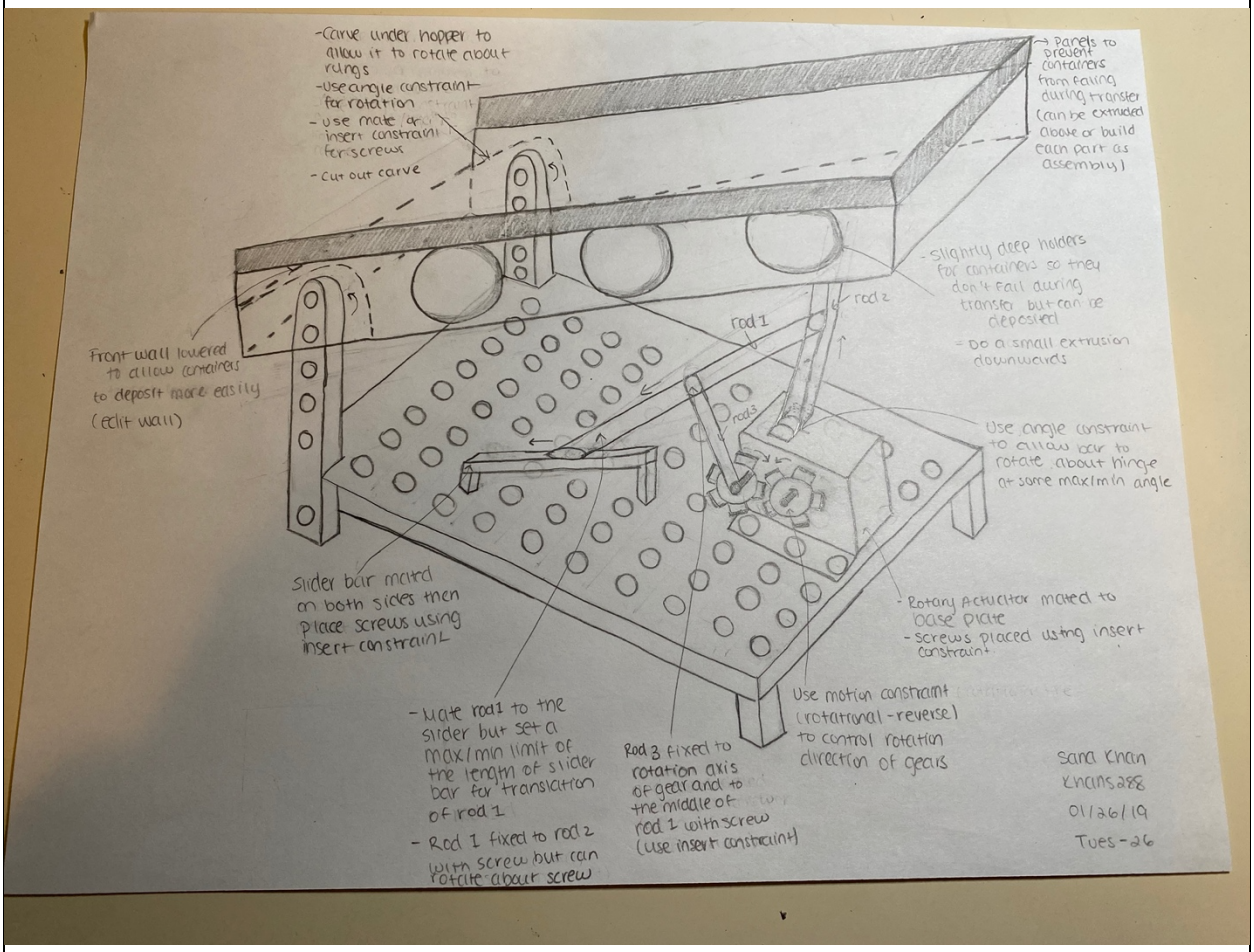
We are asking that you submit your work on both worksheets. It does seem redundant, but there are valid reasons for this:

- Each team member needs to submit their detailed sketches 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

Team Number: Tues-26

Name: Sana Khan	MacID khans288

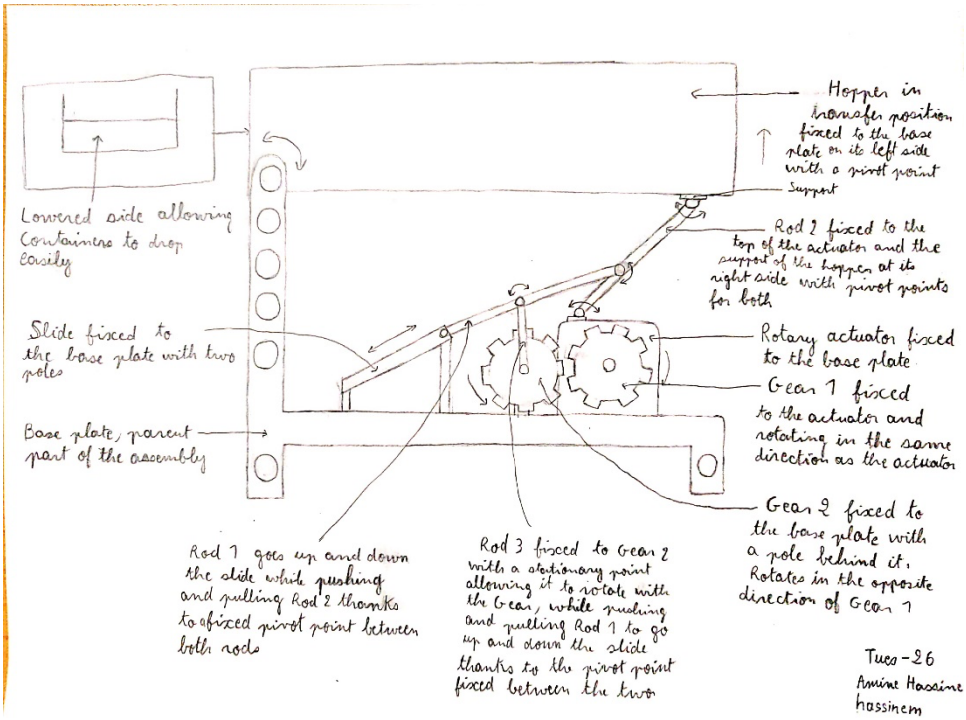
Insert screenshot(s) of your detailed sketch below.



Team Number: Tues-26

Name: Amine Hassine	MacID hassinem

Insert screenshot(s) of your detailed sketch below.



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

MILESTONE 3 (STAGE 3) – PROGRAM TASK PLANNING (COMPUTATION SUB-TEAM)

Team Number: Tues-26

1. As a team, write out the pseudocode or create a flowchart for the indicated tasks in the space below.
   → If creating a flowchart, complete your flowchart on a separate sheet of paper, take a photo of your sketch and insert photo as a Picture (Insert > Picture > This Device)

Dispense Container

``

```
Dispense_container function:
        bottles = [1,2,3,4,5,6]
        Container_Properties = [ ]
        My_table.dispense_container(random.choice(bottles))
        Container_properties = My_table.container_properties()
        Rotate turntable for Qarm pickup

        Return Container_properties
```

Load Container

```
load_container function:
        num_container = 0
        con_properties = Dispense_container()
        If con_properties = ######:
                Color = ####
        Elif…..

        While num_container < 3 or mass_qbot < 90 or con_properties == new_conprop:
                rest
                arm.home()
                arm.move_arm(x,y,z of the container at sorting station)
                arm.control_gripper(45)
                arm.home()
                arm.move_arm(x,y,z of the hopper on Q_bot)
                arm.control_gripper(-45)
                arm.home()
                mass_Qbot()
                num_container += 1
                new_conprop = Dispense_container()

        return Color
```

Transfer Container

```
transfer_container function:
        bin_color = load_container()
        bot.activate_color_sensor(bin_color)
        bot.follow_line(0.1)

        if bot.activate_color == color:
                bot.stop()
                bot.rotate(90)
```

Deposit Container

```
Deposit_container function:
        Bot.follow_line(0.1)
        Bot.dump()
```

Return Home

```
Return home function:
        Bot.rotate(180)
        Bot.follow_line(0.1)
        Bot.rotate(180)
        Bot.follow_line(0.1)
```

MILESTONE 3 (STAGE 4) – PRELIMINARY MODELLING (MODELLING SUB-TEAM)

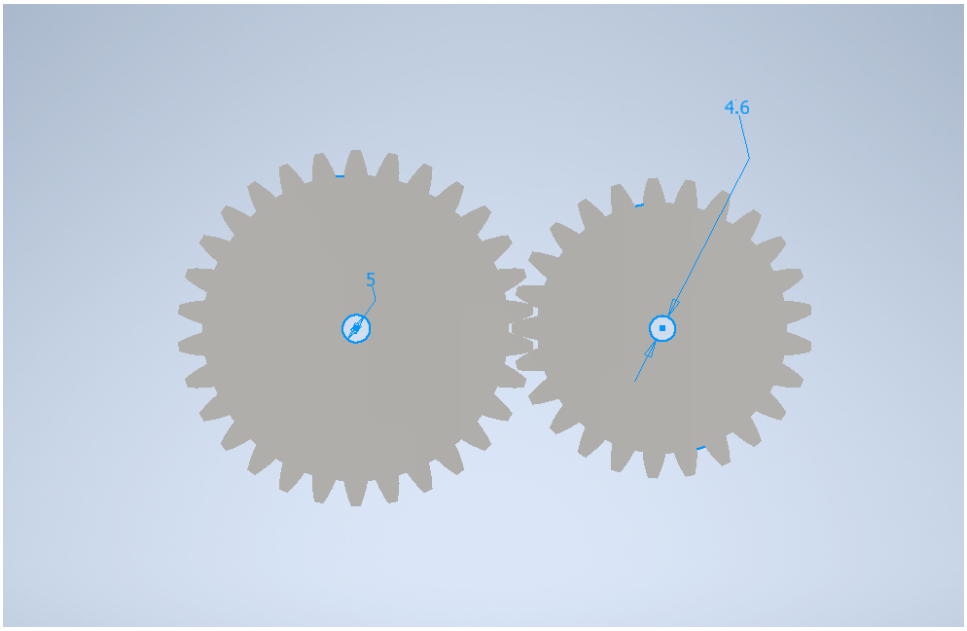
Team Number: Tues-26

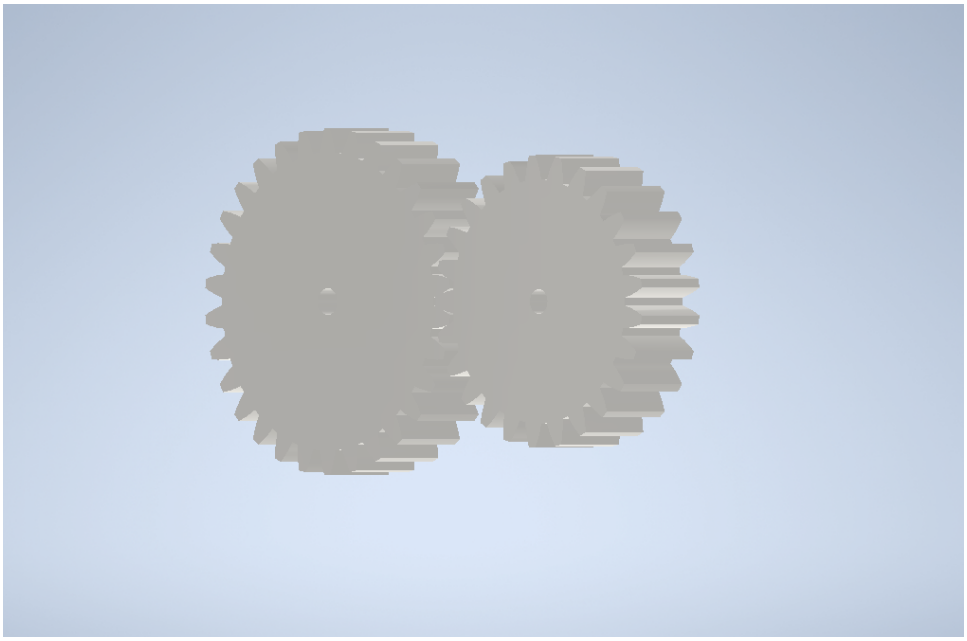
1. As a team, create solid models of the various components of your device in Autodesk Inventor, based on the detailed sketches.
   → Take multiple screenshots of each solid model you create
   → Insert your photo(s) as a Picture (Insert > Picture > This Device)
   → **Do not include more than *two* solid modelling screenshots per page**

Team Number: Tues-26

Name: Amine Hassine	MacID hassinem

Gear 1 and 2

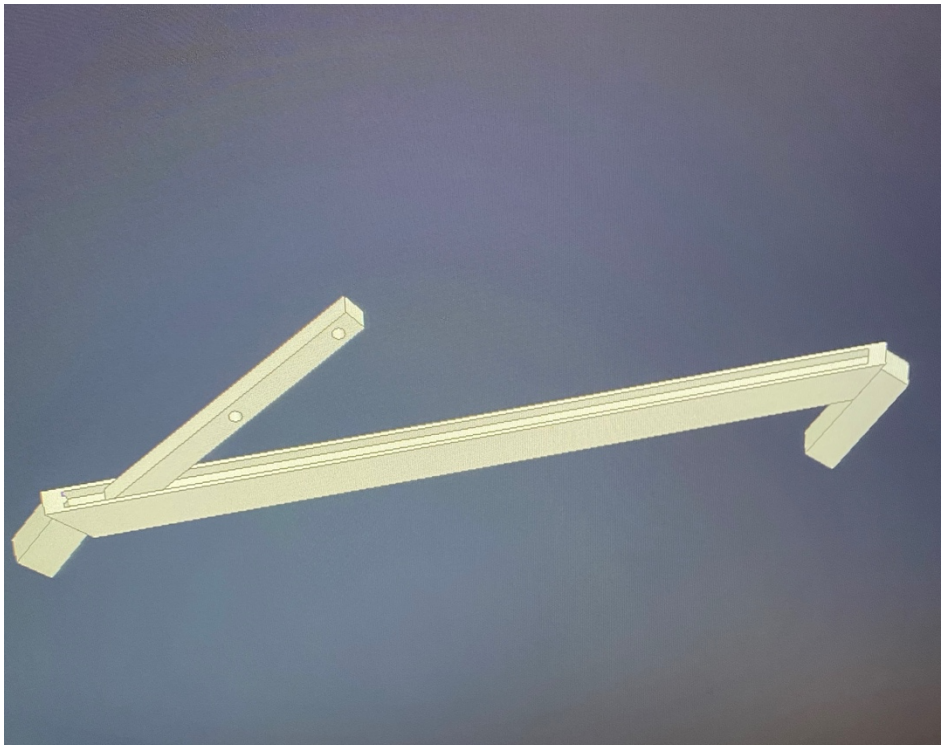




*Limit screenshots to no more than 2 per page. For additional screenshots, please copy and paste the above on a new page

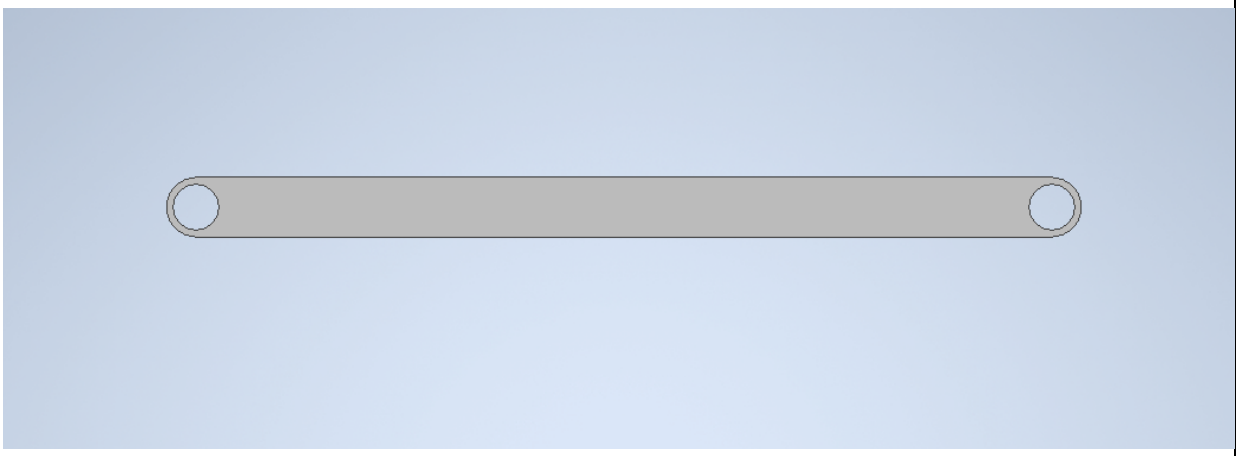
Name: Sana Khan	MacID khans288

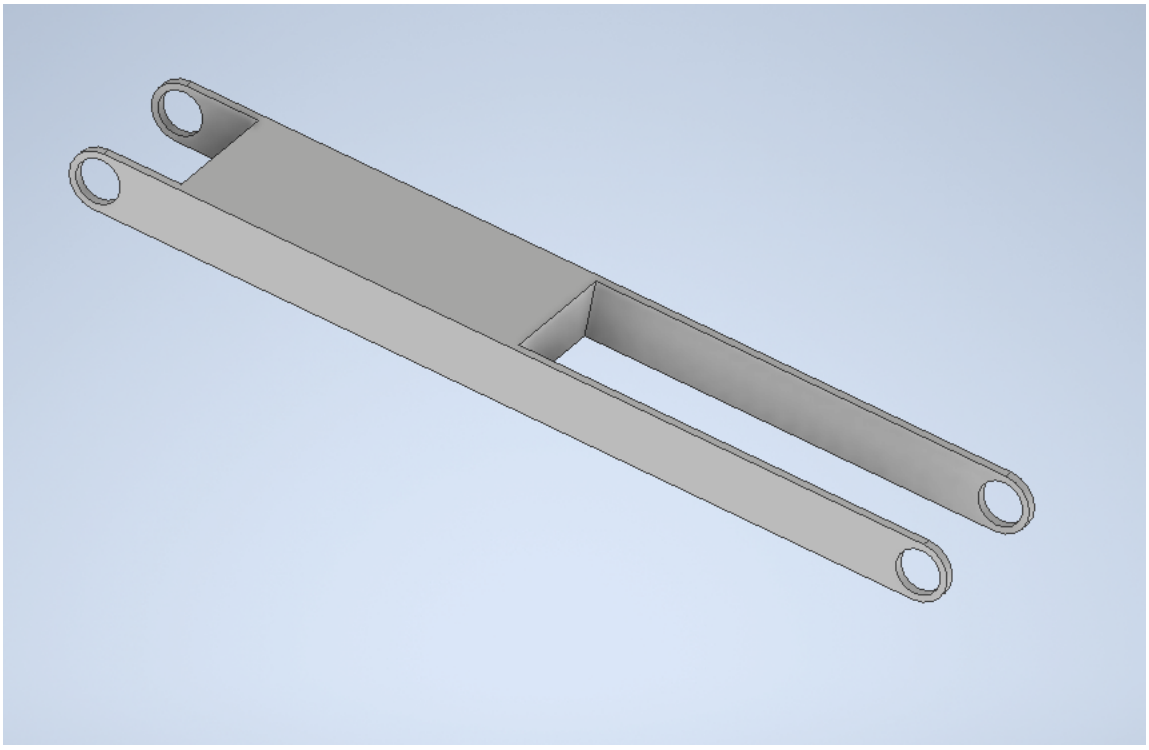
Slider and Rod 1



Name: Amine Hassine	MacID hassinem

Rod 3





Name: Amine Hassine	MacID hassinem

Rod 2