ENGINEER 1P13: PROJECT THREE WORKSHEETS (INDIVIDUAL)

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PROJECT THREE: MILESTONE ONE: PROBLEM FRAMING AND CONCEPTUAL DESIGN

Milestone 1 (Stage 1) – Initial Problem Statement, Objectives and Constraints

Team ID:

Fri-37

Complete this worksheet individually before coming to Design Studio.

Initial Problem Statement

1. Write the initial problem statement in the space below. This was discussed in your first lecture and is provided in the Avenue announcement.

Design a system for sorting and recycling containers.

Objectives and Constraints

Create a list of objectives and constraints in the table below. The exact number you should have depends on what information you have gathered from the Project Module and previous lectures.

Objectives	 User Input Handling (Physical) Dispense to Sorting Station Determing Container Variables Mass dependant delivery later. Container Transfer Q-Arm Q-Bot Container Delivery Hopper Rotation Sensor Activation and Deactiviation Trajectory Following Home Position Return Repeated Task Execution (i.e the above in a loop of some kind) Virtually mounted sensors
Constraints	- User Input Validation

- Bin Recognition Accuracy
- Safety Measures
- Power Consumption
- Cost Consideration (More of Modelling as I believe they have to pay)
- Maintenance and Reliability (if we consider a long-term solution)
 Environment Adaptability (having the Q-bot understand the environment it will work in)
- Sensor accuracy

PROJECT THREE: MILESTONE ONE: PROBLEM FRAMING AND CONCEPTUAL DESIGN

MILESTONE 1 (STAGE 3) – SENSOR EXPLORATION (COMPUTING SUB-TEAM)

Team ID: Fri-37

Complete this worksheet individually *during* Design Studio.

- Each team member is expected to complete the demo for at least four (4) of the five (5) sensors available for characterizing bins
 - \rightarrow Refer to Table 3 in the Project Objective 3 section of the Project Module for a list of available sensors
- 2. For each sensor:
 - \rightarrow Briefly describe how the sensor works
 - ightarrow Indicate the attribute you would measure to characterize each bin
- 3. Complete your sensor research on the following page
 - ightarrow Be sure to clearly write your Team ID, Name and MacID

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Team ID:

Fri-37

Sensor Type	Description	Attribute(s)	
Ultrasonic Sensor	Measures the distance of the target object using ultrasonic sound waves to measure the distance efficiently	Distance to Bins	
	Location: Front of Q-Bot		
	Range: 2.5m, if not in range returns 0		
Hall Sensor	Hall Sensor determines if the object is a metal by giving the number 1 if true otherwise 0 for a non-metal.	Detects Metals	
	Location: Side of Q-Bot		
	Tested Range: Works at 5cm		
Active Infrared (IR) Sensor	The IR sensor can emit and detect infrared radiation like heat to tell how close the object is to the sensor using voltage readings.	Measures distance to bins	
	Location: Side of Q-Bot		
	Range: 0.25m, if not in range returns 0		
Color Sensor	Returns RGB values of the bins that is in front of the sensor.	Detects Colors	
	Location: Side of Q-Bot		
	Range: 0.25m		

PROJECT THREE: MILESTONE ONE: PROBLEM FRAMING AND CONCEPTUAL DESIGN

MILESTONE 1 (STAGE 4) – MECHANISM CONCEPT SKETCHES (MODELLING SUB-TEAM)

Team ID: Fri-37

- 1. Each team member is required to complete **two (2)** preliminary concept sketches for the mechanism design. You should incorporate a different actuator for each sketch.
 - \rightarrow Each sketch should be on a separate piece of paper
 - ightarrow Be sure to clearly write your Team ID, Name and MacID for each sketch
- 2. Take photos of your sketches
- 3. Insert your photos as a Picture on the following pages

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Team ID:

Fri-37

Name: Shadi El-Fares	MacID: elfaress	
Insert picture of preliminary concept sketch below		

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Team ID:

Fri-37

Name: Shadi El-Fares	MacID: elfaress	
Insert picture of preliminary concept sketch below		