Project: Robotics Triathlon

Sprint: Endurance

Date: 11/13/2024

Team Members: [Oleksandr, John, Avery]

1. Gantt Chart:

2. Requirements Table:

Requirement ID	Description	Priority	Status
R-01	Robot starts with a green light and announces "ready set go."	High	Completed
R-02	Robot navigates around the room perimeter without collisions.	High	Completed
R-03	Robot turns at each tile center.	High	Completed
R-04	Robot completes the circuit and returns to the starting point.	High	Completed
R-05	Robot stops with a red light and says "I'm done and I need water."	Medium	Completed

3. **Requirements Signoff Table:**

Requirement ID	Description	Approver Name	Date Approved
R-01	Robot starts with a green light and announces "ready set go."	Avery	11/13/2024
R-02	Robot navigates around the room perimeter without collisions.	Oleksandr	11/13/2024
R-03	Robot turns at each tile center.	John	11/13/2024
R-04	Robot completes the circuit and returns to the starting point.	John	11/13/2024
R-05	Robot stops with a red light and says "I'm done and I need water."	Oleksandr	11/13/2024

4. **Algorithm:**

1. **Initialize and Start:**
    1) Turn on the green LED light.
    2) Announce, "Ready, set, go."
    3) Begin moving forward along the designated perimeter path.
2. **Path Navigation:**
    1) **While navigating the path:**
        - **At each yellow floor tile:**
            - Move to the center of the tile.
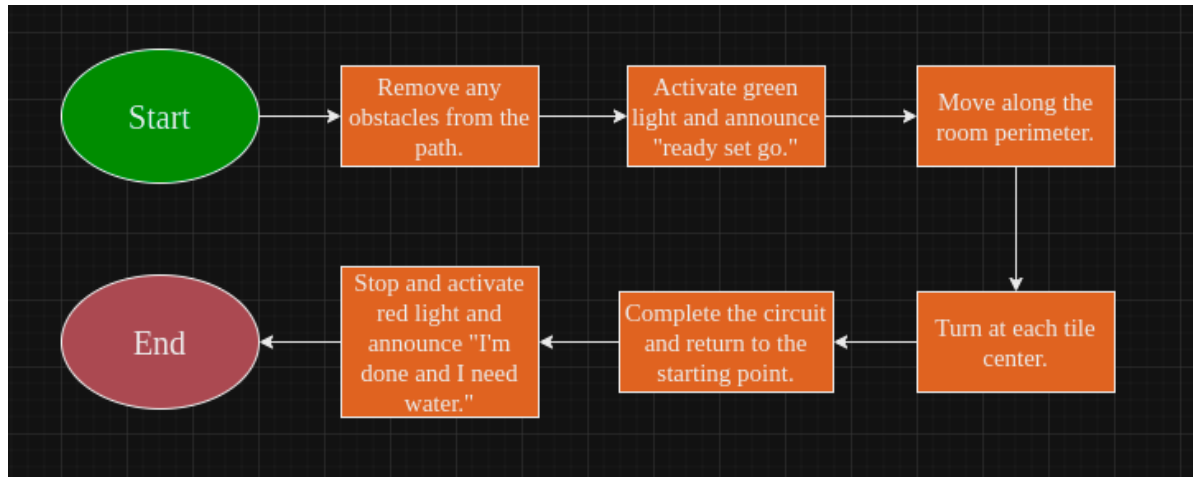   - Turn 90 degrees to the right.
3. **End of Circuit:**
    1) **When the starting location is reached** (determined by distance or location sensors):
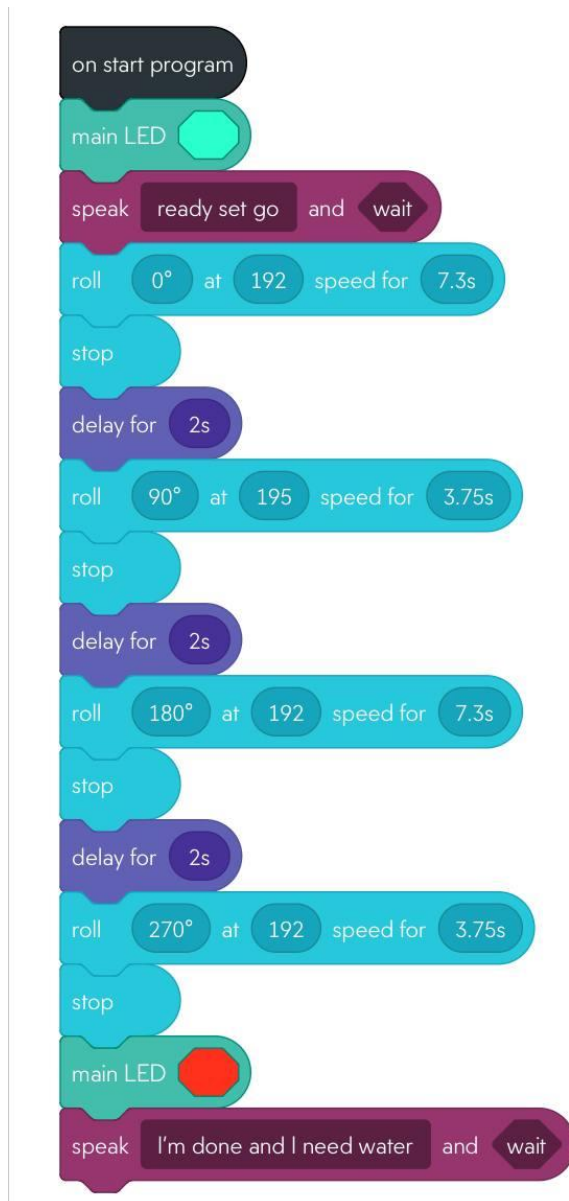   - Stop moving.
4. **Stop and Announce Completion:**

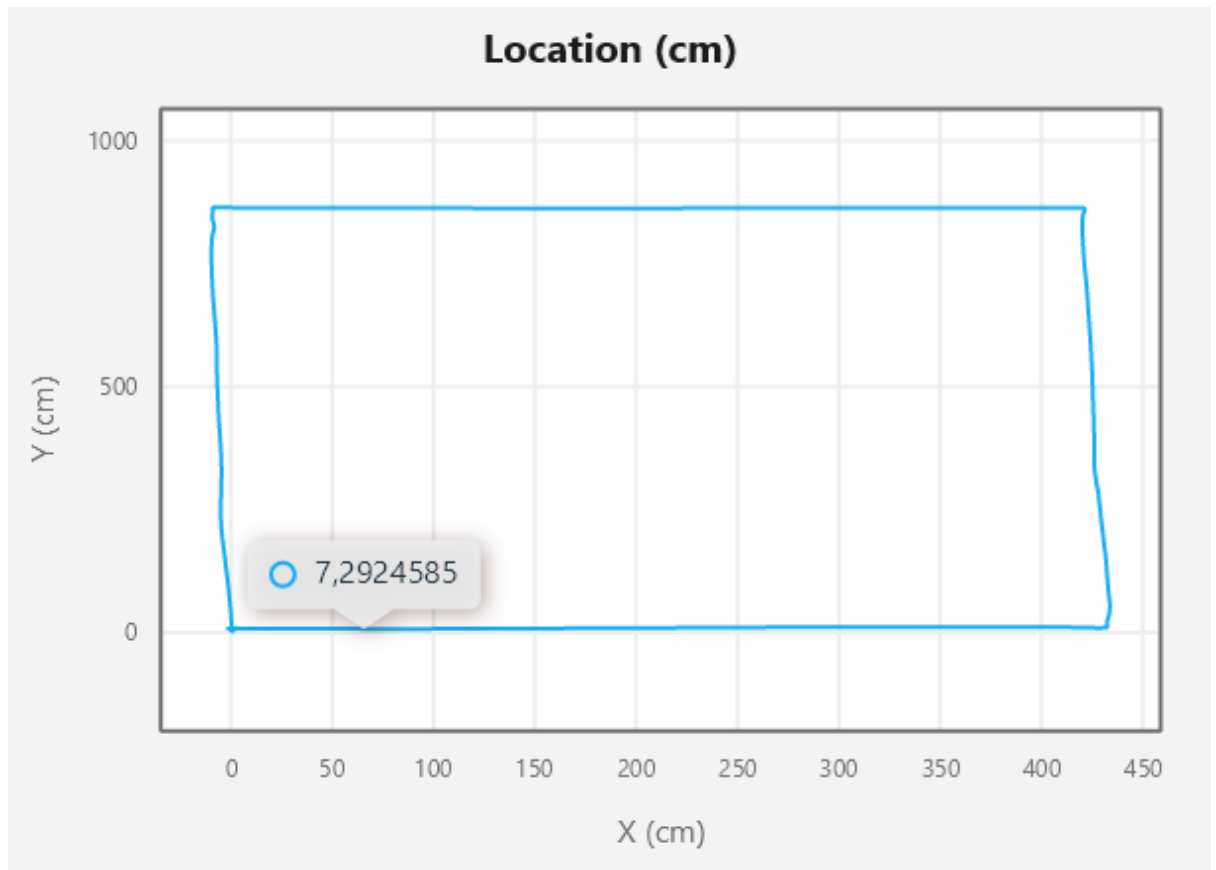1) Turn on the red LED light.
2) Announce, "I'm done and I need water."

5. Flowchart:

6. Block code:

on start program

main LED

speak ready set go and wait

roll 0° at 192 speed for 7.3s

stop

delay for 2s

roll 90° at 195 speed for 3.75s

stop

delay for 2s

roll 180° at 192 speed for 7.3s

stop

delay for 2s

roll 270° at 192 speed for 3.75s

stop

main LED

speak I'm done and I need water and wait

7. Sensor data diagram:

8. Test Table:

Test Case ID	Description	Expected Result	Actual Result	Status
T-01	Robot starts with green light and sound cue.	Robot displays green light, says "ready set go."	Robot displays green light, and says "ready set go."	Tested
T-02	Robot follows path around room perimeter.	Robot completes perimeter circuit without collisions.	Robot completes perimeter circuit without collisions.	Tested
T-03	Robot turns at each tile center.	Robot turns at each yellow tile center.	Robot turns at each yellow tile, but not	Tested

			exactly in the center.	
T-04	Robot returns to the starting point.	Robot reaches and stops at starting location.	Robot reaches and stops at starting location.	Tested
T-05	Robot stops with red light and sound cue.	Robot displays red light, says "I'm done and I need water."	Robot displays red light, and says "I'm done and I need water.".	Tested

9. Staffing Plan:

Team Member	Role	Responsibilities	Reports To
Oleksandr	Project Manager	Oversees Endurance Sprint, manages timeline.	Team Lead
John	Algorithm Dev	Designs and codes the path navigation algorithm.	Project Manager
Avery	Flowchart Designer	Creates flowchart using draw.io.	Project Manager
John	Tester	Tests robot functionality and verifies results.	Project Manager
Oleksandr	Documenter	Finalizes Gantt chart, flowchart, and documentation.	Project Manager