**Sprint 1 - Endurance Design Document**

**March 23, 2023**

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# 1. Executive Summary

## ***1.1*** ***Project Overview***

We are tasked with creating a program for a robot. Within this program the robot must be able to speak, change colors, and navigate a specified course provided by the professor. The robot must successfully travel around the periphery of HH208 (circumnavigate). A clear path will be provided from each outside wall. Robot will start from the yellow square with blue tape. Robot should start with a green light and speak ‘ready set go’ and stop with a red light and speak ‘I’m done and I need water’. Robot must travel to each of the yellow floor tiles and turn right at the center of each tile. Robot must return to its starting location. Robot should not collide with any objects as it goes around the room. Points deducted if robot does not light and speak at start and finish, if it collides with anything, or if it does not finish in the square where it started. (You may scale down the course for this sprint if space is an issue)

# 2. Product/Service Description

In this section, describe the general factors that affect the product and its requirements. This section should contain background information, not state specific requirements (provide the reasons why certain specific requirements are later specified).

## ***2.1*** ***Product Context***

This product is part of a three part series. This first part is to show basic understanding of the material and to express any concerns within the material.

## ***2.2*** ***User Characteristics***

· Student/faculty/staff/other

· experience

· technical expertise

## ***2.3*** ***Assumptions***

* Need basic training in working with robots
* Need spacial awareness
* Availability to technology

## ***2.4*** ***Constraints***

· system resource constraints

· availability of team members

· time to complete project

## ***2.5*** ***Dependencies***

· Device must be able to run the program

· availability of both team members

# 3. Requirements

**Priority Definitions**

· Priority 1 – Technology and education required to complete the process. Time Management in order to complete the project in time.

· Priority 2 – Ability to code and fufill all requirements.

·Priority 3- User friendly materials, and little to no experience friendly

## ***3.1*** ***Functional Requirements***

| **Req#** | **Requirement** | **Comments** | **Priority** | **Date Rvwd** | **SME Reviewed / Approved** |
| --- | --- | --- | --- | --- | --- |
| ENDUR\_01 | Develop a plan | Create an outline for how we are going to complete the project | 1 | 3/2/23 | Approved by both parties |
| ENDUR\_02 | Build requirements table | Input data regarding requirements | 2 | 3/19/23 | Waiting approval |
| ENDUR\_03 | Create an algorithm | Create an algorithm for the program that the robot is to complete | 3 | 3/19/23 | approved |
| ENDUR\_04 | Develop a Flowchart | Create a flowchart that encompasses the program for the robot | 4 | 3/22/23 | Completed |
| ENDUR\_05 | Create Code | Create a code for the robot to navigate | 5 | 3/2/2023 | approved |
| ENDUR\_06 | Testing | Test the code that was created | 6 | 3/21/23 | approved |
| ENDUR\_07 | Input of Data to GitHub | Collect all data in one location | 7 | 3/22/23 | approved |

# 4. Requirements Confirmation/Stakeholder sign-off (Gillian provided the information for this section)

Include documentation of the approval or confirmation of the requirements here. For example:

| **Meeting Date** | **Attendees (name and role)** | **Comments** |
| --- | --- | --- |
| 03/22/23 | Vaughn | confirmed |
| 03/22/23 | Gillian | confirmed |

# 5. System Design

## ***5.1*** ***Algorithm***

* Start Program
* Main LED should be green upon start
* Command robot to speak “ready set go”
* Navigate the first pass straight forward
* Stop moving
* Delay
* Turn 90 degrees right
* Navigate second pass forward
* Stop moving
* Delay
* Repeat steps 7 through 10 for 3 passes
* Change main LED to red
* Command robot to speak “ Im done and need water
* End program

## ***5.2*** ***System Flow (Gillian provided the information for this section)***

Develop a flowchart (and show here) that accurately depicts how your software application will act to fulfill the algorithm

[***https://drive.google.com/file/d/1C4iWQD64o6uFsPs6v2MRIcS\_QgF5rjcA/view?usp=sharing***](https://drive.google.com/file/d/1C4iWQD64o6uFsPs6v2MRIcS_QgF5rjcA/view?usp=sharing)

***5.3*** ***Program Code***

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## ***5.4*** ***Program sensory Data***

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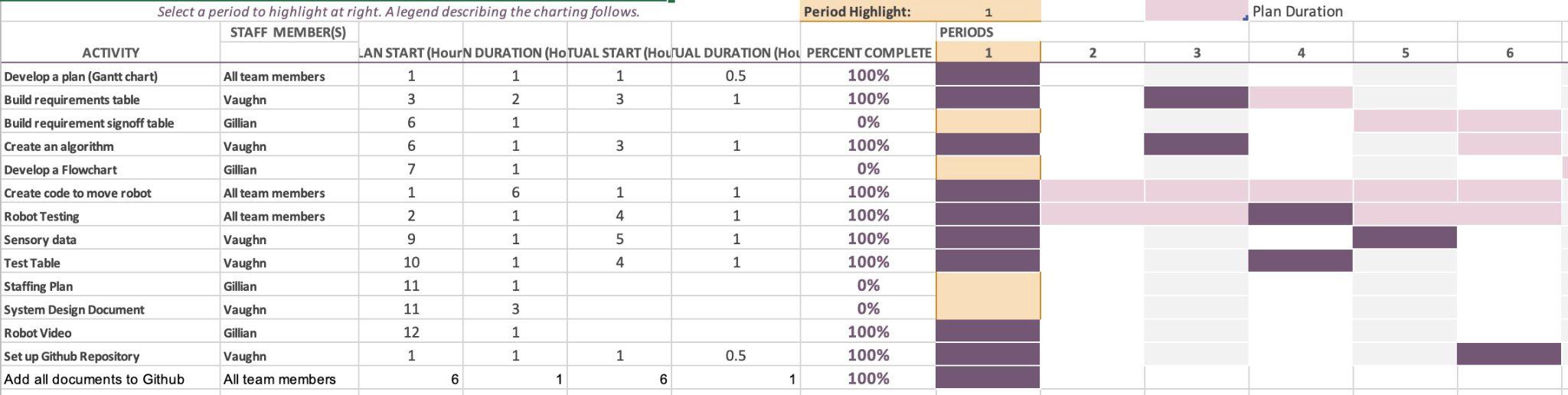
## 

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## ***5.5*** ***Test Plan***

| **Reason for Test Case** | **Test Date** | **Expected Output** | **Observed Output** | **Staff Name** | **Pass/Fail** |
| --- | --- | --- | --- | --- | --- |
| Trial 1 | 3/21 | Perfomed correct route | Did not go the desired distance | Vaughn | fail |
| Length 1 test 2 | 3/21 | Perfomed correct route | Went too far | Vaughn | fail |
| Length 1 test 3 | 3/21 | Perfomed correct route | Did not drive in a straight line and went too short | Vaughn | fail |
| Length 1 test 4 | 3/21 | Perfomed correct route | Did not drive in a straight line | Vaughn | fail |
| Length 1 test 5 | 3/21 | Perfomed correct route | Performed correct route | Vaughn | pass |
| Lengths 1 and 2 test 1 |  | Perfomed correct route | Perfomed correct route | Vaughn | Pass |
| Lengths 1-3 test 1 |  | Perfomed correct route | Did not turn for third length | Vaughn | Fail |
| Lengths 1-4 |  | Perfomed correct route | Perfomed correct route | Vaughn | Pass |

***5.6*** ***Task List/Gantt Chart***

<https://docs.google.com/spreadsheets/d/1UFIyN3I8Jj5mZiZUyYkppFF-r7a75_rJVydy-WQ7yS4/edit?usp=sharing> 

## ***5.7*** ***Staffing Plan (Gillian provided the information for this section)***

Insert a chart/table that depicts the roles and responsibilities of each team member that worked on this project

| Name | Role | Responsibility | Reports To |
| --- | --- | --- | --- |
| Vaughn/Gillian | Develop a plan (Gantt chart) | Develop a plan (Gantt chart) | Vaughn/Gillian |
| Vaughn | Build requirements table | Build requirements table | Vaughn/Gillian |
| Gillian | Build requirement signoff table | Build requirement signoff table | Vaughn/Gillian |
| Vaughn | Create an algorithm | Create an algorithm | Vaughn/Gillian |
| Gillian | Develop a Flowchart | Develop a Flowchart | Vaughn/Gillian |
| Vaughn/Gillian | Create code to move robot | Create code to move robot | Vaughn/Gillian |
| Vaughn/Gillian | Robot Testing | Robot Testing | Vaughn/Gillian |
| Vaughn | Sensory data | Sensory data | Vaughn/Gillian |
| Vaughn | Test Table | Test Table | Vaughn/Gillian |
| Gillian | Staffing Plan | Staffing Plan | Vaughn/Gillian |
| Gillian | Robot Video | Robot Video | Vaughn/Gillian |
| Vaughn | Set up Github Repository | Set up Github Repository | Vaughn/Gillian |
| Vaughn/Gillian | Add all documents to Github | Add all documents to Github | Vaughn/Gillian |