Sprint 1 - Endurance Design Document

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1. Executive Summary

1.1. Project Overview

- This project has been conducted to test the endurance of the Sphero robot. This project's intended audience consists of students and teachers.

1.2. Purpose and Scope of this Specification

The purpose of this specification is to execute an algorithm that successfully carriers the SPRK2 around a field in which its purpose was to stay on the blue line or close to it. The intended audience of this experiment is our class and any outside sources who want to learn how to program and set up a SPRK2.

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

- The SPRK2 is an independent product with the help of the operating system on your Apple or Android, phone and computer. The SPRK2 does interface with a lot of related systems as within the app there are all different types of products that can interface with the SPRK2. These relationships consist of building a flowchart after successfully using the app Sphero Edu. With the proper tools this endurance test was rather simple in the regard of figuring out the interconnection of the SPRK2 with the app in order for it to run.

2.2. User Characteristics

Create general customer profiles for each type of user who will be using the product. Profiles should include:

- Students who are enrolled in computer science classes
- Faculty/staff who teach computer science courses
- Those working in the computer science field

2.3. Assumptions

- When entering the room to do the first sprint test on the SPRK2 we had doubts whether the room would be open or not do the test. Upon arriving we were granted access to the room. After that we both opened our SPRK2 we had no difficulty accessing the operating systems via phone or computer. Other than that we had no assumptions that made out Sprint test anymore difficult.

2.4. Constraints

Describe any items that will constrain the design options, including

- System resource constraints (e.g., limits on disk space or other hardware limitations)
- Block programming problems
- Wifi / bluetooth availability
- Laptop / computer availability

2.5. Dependencies

- The dependencies needed in order to successfully carry out the SPRK2 endurance run involve minute amount of equipment. This equipment involved the SPRK2, a computer or phone with working Bluetooth, a clean path with no desks or other obstacles (we hit a desk on a pretrial).

3. Requirements

3.1. Functional Requirements

In the example below, the requirement numbering has a scheme - BR_LR_0## (BR for Business Requirement, LR for Labor Relations). For small projects simply BR-## would suffice. Keep in mind that if no prefix is used, the traceability matrix may be difficult to create (e.g., no differentiation between '02' as a business requirement vs. a test case)

The following table is an example format for requirements. Choose whatever format works best for your project.

For Example:

Req#	Requirement	Comments	Priority
1	Device with bluetooth (phone / computer)	Needed for operating the robot, using Sphero edu, opening and completing the documents	1
2	Sphero Robot	Needed in order to conduct the block code and collect the data	1
3	Charger and Outlet	Needed to charge the robot and phone / laptop	1
4	Classroom	Nice to have a large empty room but is not a necessity	3
5	Tape on the ground to outline to robot path	Good for outlining exactly what path the robot has to follow	2
6	Large well lit room	Important for having enough light and space for conducting the tests	2

3.2. Security

3.2.1. Protection

- We did not utilize any system protection.

3.2.2. Authorization and Authentication

- We did not use any authorization and authentication factors (unless logging into the Sphero app counts).

3.3. Portability

- When coming to Howard Hall 208 we had to bring both of our SPRK2 kits with charger and chagrining port. Upon arrival we had to turn on the lights and get the robot's set up with the correct lineage too the blue tape. When doing this we have completed transporting all goods from our homes to the class room.

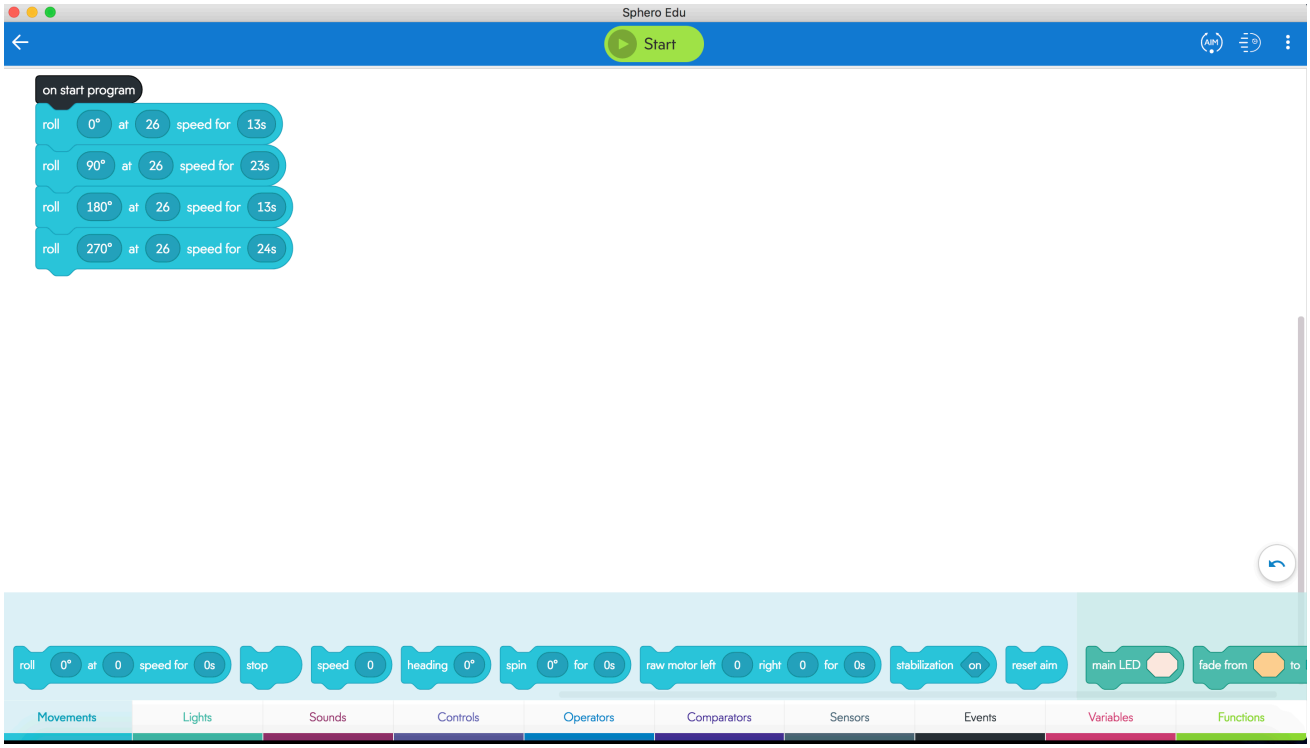
4. Requirements Confirmation/Stakeholder sign-off

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

Meeting Date	Attendees (name and role)	Comments
3/29/21	Tom and Tim	
3/30/21	Tom and Tim	

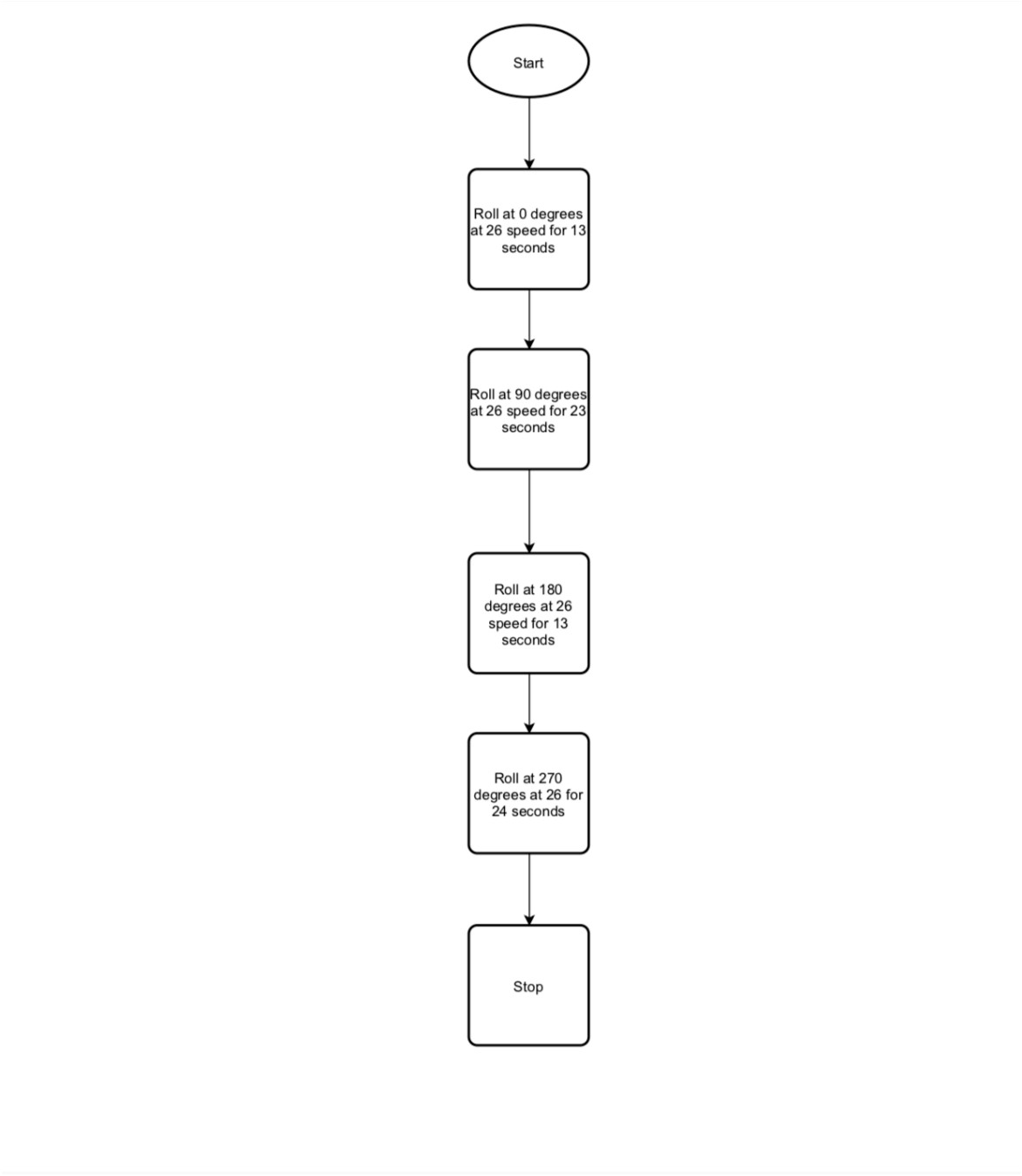
5. System Design

5.1. Algorithm



- This algorithm was made with block code in the Sphero app. It is designed to follow the tape in the classroom.

5.2. System Flow



5.3. Software

Excel, Draw io, Sphero Edu, Google docs

5.4. Hardware

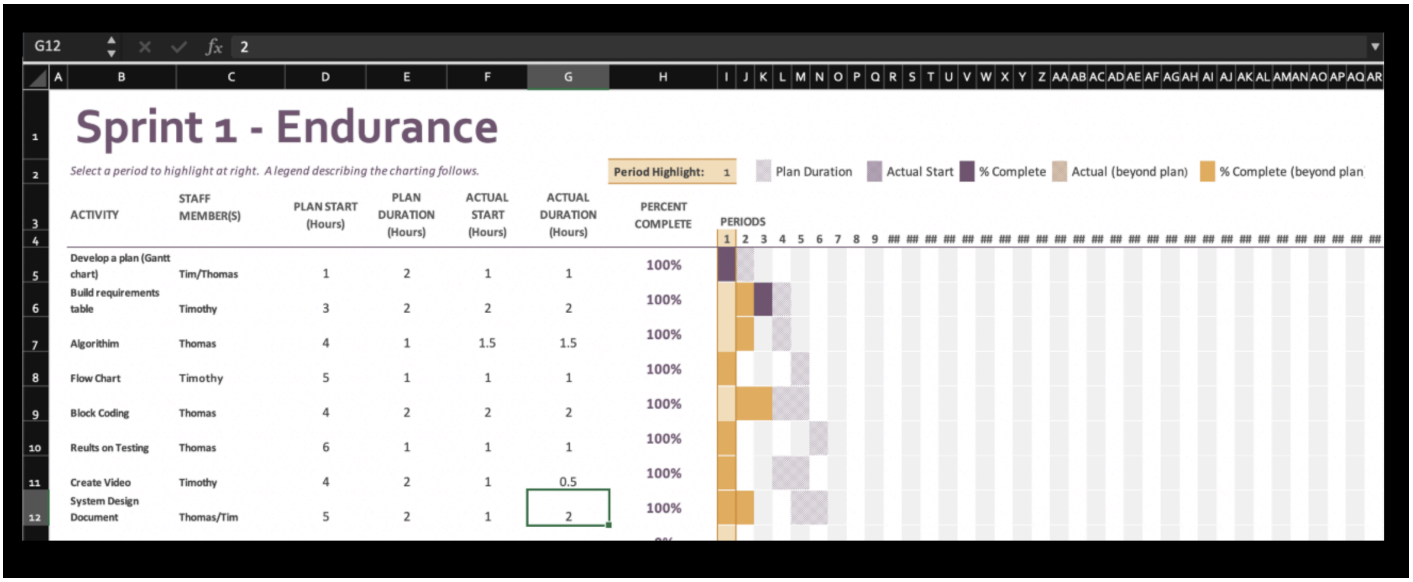
SPRK2 robot, Two Macbook laptops, chargers

5.5. Test Plan

Include a test plan showing all unit tests performed for this application, Include test rational, test date, staff member, pass/fail status

Reason for Test Case	Test Date	Expected Output	Observed Output	Staff Name	Pass/Fail
To create a program that allows the robot to successfully follow the course.	3/30/21	To have the robot stay on track without swaying off course	Robot swayed left, went off course		Fail
	3/30/21		Robot hit desk on 2nd turn		Fail
	3/30/21		Robot followed course but was slightly off track swaying right		Fail
	3/30/21		Robot successfully followed course all the way through		Pass

5.6. Task List/Gantt chart



5.7. Staffing Plan

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

Name	Role	Responsibility	Reports To
Thomas	Programmer/ FlowChart	To complete the responsibilities needed to pass this endurance test	Gill Eckertt
Tim	Gantt Chart/ Summary	To complete the responsibilities needed to pass this endurance test	Gill Eckertt