Jonathan Peralta, Lyah Morales

Sprint 3 - Agility

1.1 Project Overview

In the third sprint, the robot must run an obstacle course. The sphero has to avoid three obstacles it will encounter. Once it reaches the stage 2 square, it must it must go over the ramp. In stage 3, the robot must knock down as many pins as possible. Points will be added for each obstacle avoided, every stage completed, every pin it knocks down, and if the robot stops on the square it is supposed to.

1.2 Purpose and Scope of this Specification

The purpose of this project is to teach new programmers how to program/code a robot to do certain tasks. In this case, sensing obstacles it must avoid and complete other tasks

2. Product/Service Description

Some factors within this project include the sphero, which is a spherical robot. The robot is controlled by an interface either on a computer, laptop, or mobile device.

2.1 Product Context

In order to perform tasks, the robot must be programmed with commands. The same is done for other products.

2.2 User Characteristics

Due to its simple way of coding (Drag & Drop) it can be used by individuals at the beginner's level

2.3 Assumptions

A person cannot test their code if they do not have access to a robot

2.4 Constraints

- Robot may not always travel straight after being aimed
- It may be difficult to control at times
- The protective cover might hinder mobility

2.5 Dependencies

- Sphero app account (Can be accessed in phone, computer, tablet, etc)

- Robot

3. Requirements

Req#	Requirement	Comments	Priority	Date Rvwd	SME Reviewed / Approved
AGILITY-01	The robot must not collide with any obstacles at the beginning of the sprint		1	11/22/19	Jonathan Peralta Lyah Morales
AGILITY-02	The robot must pass through a ramp		2	11/25/19	Jonathan Peralta Lyah Morales
AGILITY-03	The robot should knock down as many pins as possible at the end of the sprint		3	11/25/19	Jonathan Peralta Lyah Morales

3.2 Security

3.2.1 Protection

- Creating a firewall

3.2.2 Authorization and Authentication

Authentication verifies who you are, while Authorization decides whether a user is allowed to use the system

3.3 Portability

The code can easily be accessed on any device containing the sphero app. Within the app, anyone can use any code as long as it is public

4.Requirements Confirmation/Stakeholder sign-off

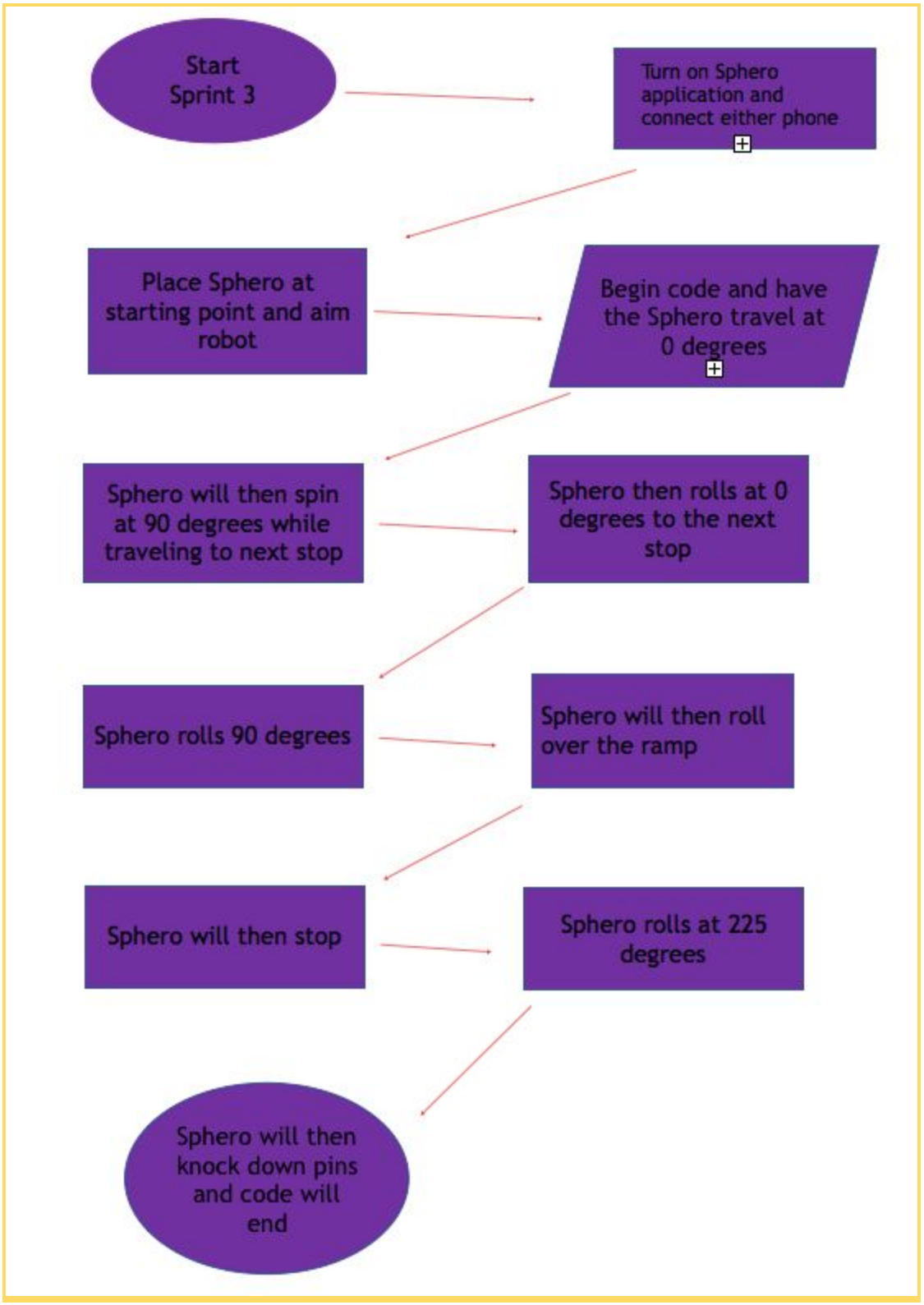
Meeting Date	**Attendees (name and role)**	**Comments**
11/22/19	Jonathan Peralta Lyah Morales	
11/25/19	Jonathan Peralta Lyah Morales	

5. System Design

5.1 Algorithm

1. Connect robot to sphero application via bluetooth (Laptop, Phone, Tablet, etc.)
2. Place robot at starting point
3. Aim robot
4. Sphero begins to travel 0°
5. Sphero spins 90° and travels to next stop
6. Sphero rolls 0° to next stop
7. Sphero must not collide with any of the three obstacles
8. Sphero rolls 90°
9. Sphero rolls over ramp
10. Sphero stops
11. Sphero rolls 225°
12. Sphero knocks down pins

5.2 System Flow



5.3 Software

The program was developed using the sphero application, which uses block-code and Javascript

5.4 Hardware

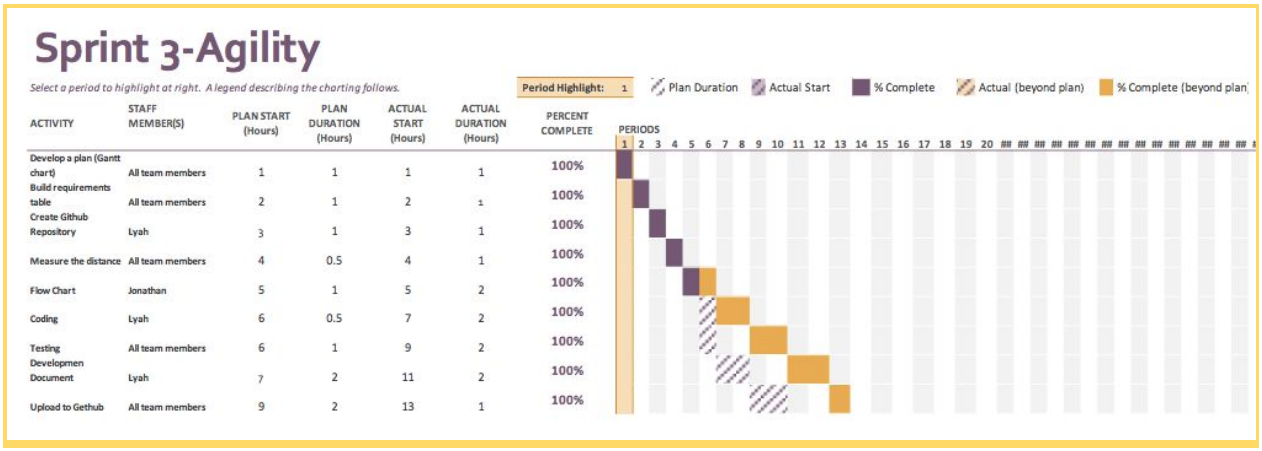
The hardware platforms used were the robot, and laptop (with sphero app) connected via Bluetooth

5.5 Test Plan

Reason for Test Case	Test Date	Expected Output	Observed Output	Staff Name	Pass/Fail
Robot should travel 0° at the beginning of the sprint without straying off the path	11/22	Sphero travels 0° without straying off path	Sphero traveled 0°	Jonathan Lyah	Pass
Change amount of degrees the robot should spin (90°) and travel to the next stop.	11/22	Sphero spins 90° without straying off path	Sphero traveled 90°	Jonathan Lyah	Pass
Sphero rolls 0° to the next stop without straying off path	11/22	Sphero spins 0° without straying off path	Sphero spun 0° but strayed off path a few times and collided with obstacles	Jonathan Lyah	Fail
Sphero rolls 0° to the next stop without straying off path	11/22	Sphero spins 0° without straying off path	Sphero traveled 0° without straying off path	Jonathan Lyah	Pass

Sphero must not collide with any obstacles at the beginning of the sprint	11/22	The robot must not collide with any obstacles at the beginning of the sprint	Sphero collided with obstacles at the beginning of the sprint	Jonathan Lyah	Fail
Sphero must not collide with any obstacles at the beginning of the sprint	11/22	The robot must not collide with any obstacles at the beginning of the sprint	Sphero did not collide with any obstacles at the beginning of the sprint	Jonathan Lyah	Pass
Sphero travels 90°	11/25	Sphero travels 90°	Sphero traveled 90°	Jonathan Lyah	Pass
Sphero rolls over the ramp	11/25	Sphero rolls over the ramp	Sphero did not roll over the ramp	Jonathan Lyah	Fail
Sphero rolls over the ramp (Adjusted speed)	11/25	Sphero rolls over the ramp	Sphero rolled over the ramp	Jonathan Lyah	Pass
Sphero stops after going over ramp	11/25	Sphero stops after going over ramp	Sphero stopped after going over ramp	Jonathan Lyah	Pass
Sphero travels 225°	11/25	Sphero travels 225°	Sphero traveled 225°	Jonathan Lyah	Pass
Sphero knocks down pins	11/25	Sphero knocks down pins	Sphero knocked down pins	Jonathan Lyah	Pass

5.6 Task List/Gantt Chart



5.7 Staffing Plan

Name	Role	Responsibility	Reports To
Jonathan	-Gantt Chart -Flow Chart -Testing	-Creating a flowchart based on the algorithm -Completing Gantt Chart -Measure distance	Lyah
Lyah	-Repository -Design Document -Programming -Testing	-Creating repository -Completing Design Document -Creating code -Testing Program	Jonathan