

```
/******  
2   * Includes  
3   *****/  
4   #include <gtest/gtest.h>  
5   #include <fstream>  
6   #include <iostream>  
7   #include <string>  
8   #include <vector>  
9   #include <streambuf>  
10  
11  #include "src/Explore.h"  
12  #include "src/LightFactory.h"  
13  #include "src/pose.h"  
14  
15  /*****  
16  * TEST FEATURE SetUp  
17  *****/  
18  class ExploreBehaviorTest : public ::testing::Test {  
19  public:  
20      virtual void SetUp() {  
21          light = factory.Create();  
22      }  
23  protected:  
24      csci3081::ExploreBehavior eb;  
25      csci3081::LightFactory factory;  
26      csci3081::Light * light;  
27      double speed = 5.0;  
28  };  
29  
30  /*****  
31  * Test Cases  
32  *****/  
33  
34  TEST_F(ExploreBehaviorTest, NoEntity) {  
35      std::vector<csci3081::Pose> light_sensors;  
36      light_sensors.push_back(csci3081::Pose());  
37      light_sensors.push_back(csci3081::Pose());  
38  
39      light = NULL;  
40      csci3081::WheelVelocity wv = eb.CalculateVelocity(light, speed,  
41          light_sensors);
```

```
42 csci3081::WheelVelocity expected = csci3081::WheelVelocity(1.0/0.0001, 1.0/0.0001, speed);
43
44 EXPECT_EQ(wv.left, expected.left) << "FAIL: Default left wheel velocity incorrectly calculated";
45 EXPECT_EQ(wv.right, expected.right) << "FAIL: Default right wheel velocity incorrectly calculated";
46 }
47
48 TEST_F(ExploreBehaviorTest, CloseDistance) {
49     std::vector<csci3081::Pose> light_sensors;
50     light_sensors.push_back(csci3081::Pose(200, 190));
51     light_sensors.push_back(csci3081::Pose(200, 190));
52
53     csci3081::WheelVelocity wv = eb.CalculateVelocity(light, speed,
54         light_sensors);
55
56     double reading_left = 1800.0/std::pow(
57         1.08, (light->get_pose()-light_sensors[0]).Length());
58     double reading_right = 1800.0/std::pow(
59         1.08, (light->get_pose()-light_sensors[1]).Length());
60
61     csci3081::WheelVelocity expected = csci3081::WheelVelocity(1.0/reading_right, 1.0/reading_left, speed);
62
63     EXPECT_EQ(wv.left, expected.left) << "FAIL: Left wheel velocity for close distance incorrectly calculated";
64     EXPECT_EQ(wv.right, expected.right) << "FAIL: Right wheel velocity for close distance incorrectly calculated";
65 }
66
67 TEST_F(ExploreBehaviorTest, MediumDistance) {
68     std::vector<csci3081::Pose> light_sensors;
69     light_sensors.push_back(csci3081::Pose(200, 150));
70     light_sensors.push_back(csci3081::Pose(200, 150));
71
72     csci3081::WheelVelocity wv = eb.CalculateVelocity(light, speed,
73         light_sensors);
74
75     double reading_left = 1800.0/std::pow(
76         1.08, (light->get_pose()-light_sensors[0]).Length());
77     double reading_right = 1800.0/std::pow(
78         1.08, (light->get_pose()-light_sensors[1]).Length());
79
80     csci3081::WheelVelocity expected = csci3081::WheelVelocity(1.0/reading_right, 1.0/reading_left, speed);
81
82     EXPECT_EQ(wv.left, expected.left) << "FAIL: Left wheel velocity for medium distance incorrectly calculated";
83     EXPECT_EQ(wv.right, expected.right) << "FAIL: Right wheel velocity for medium distance incorrectly calculated";
```

```
84 }
85
86 TEST_F(ExploreBehaviorTest, FarDistance) {
87     std::vector<csci3081::Pose> light_sensors;
88     light_sensors.push_back(csci3081::Pose(200, 100));
89     light_sensors.push_back(csci3081::Pose(200, 100));
90
91     csci3081::WheelVelocity wv = eb.CalculateVelocity(light, speed,
92         light_sensors);
93
94     double reading_left = 1800.0/std::pow(
95         1.08, (light->get_pose()-light_sensors[0]).Length());
96     double reading_right = 1800.0/std::pow(
97         1.08, (light->get_pose()-light_sensors[1]).Length());
98
99     csci3081::WheelVelocity expected = csci3081::WheelVelocity(1.0/reading_right, 1.0/reading_left, speed);
100
101     EXPECT_EQ(wv.left, expected.left) << "FAIL: Left wheel velocity for far distance incorrectly calculated";
102     EXPECT_EQ(wv.right, expected.right) << "FAIL: Right wheel velocity for far distance incorrectly calculated";
103 }
```