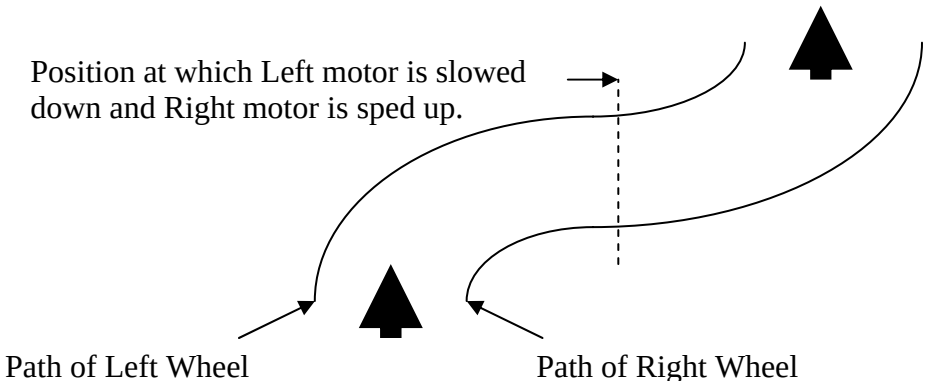
Getting to know the Rover [SOLUTION]

A. Which way is forward?

B. Getting to know the rotation sensors **(2 pts)**
   a. What is the ending value of sensor port 1 and sensor port 3 once the rover is done moving forward for 1000 hundredths of a second.
      i. Sensor 1:
      ii. Sensor 3:
   b. Did your rover move perfectly forward in a straight line?
      Probably Not.
   c. What could be done to correct this?
      The rover could be run many times to determine the appropriate average speed for the motors relative to each other, but as the battery power decreases the relative motor speeds may change. A more reliable way is to use the rotation sensors to determine which motor/wheel has traveled faster and stop/slow or speed the other one up appropriately.

      Note: Just because one wheel travels a certain distance followed by the other wheel, doesn't mean the robot has moved in a line, this only guarantees the robot is oriented in the same direction:



C. Make your rover do a 90 degree point turn **(2 pts)**
   a. What values do they report?
      i. Sensor 1:
      ii. Sensor 3:
   b. Did your rover turn perfectly about its center?
      Probably Not.
   c. What could be done to correct this?
      Ensure both wheels turn at the same speed in opposite directions.
   d. Is using "Wait" really the best way to measure the turn, is there a better way? Describe it.
      Use the rotation sensors.

D. Playing with the light sensor **(1 pt)**

a. Value of light sensor for Light Colors:
b. Value of light sensor for Dark Colors:
c. Range of values:
d. Does the sensor fluctuate:

Sometimes, by +/- 1 if help perfectly still over a surface.

Code for Part D.

```
with Lego;
use Lego;

procedure C5D is
      -- Create the constants that represent the motors and sensors.
   Left_Wheel : constant Output_Port := Output_A;
   Right_Wheel: constant Output_Port := Output_C;
   Left_Rot   : constant Sensor_Port := Sensor_1;
   Right_Rot  : constant Sensor_Port := Sensor_3;
   Light_Sensor :  constant Sensor_Port := Sensor_2;
begin
   -- Configure the Rotation Sensors
   Config_Sensor(
      Sensor => Left_Rot,
      Config => Config_Rotation);
   Config_Sensor(
      Sensor => Right_Rot,
      Config => Config_Rotation);

   -- Configure the Light Sensor
   Config_Sensor(
      Sensor => Light_Sensor,
      Config => Config_Light);

   -- Set the output power of the motors
   Output_Power(
      Output => Left_Wheel,
      Power  => Power_High);
   Output_Power(
      Output => Right_Wheel,
      Power  => Power_High);

   -- Clear the rotation sensors
   Clear_Sensor(Left_Rot);
   Clear_Sensor(Right_Rot);

   -- Make the Rover move forward
   -- Turn the Left Motor on in the Forward Direction
   Output_On_Forward(Left_Wheel);
   -- Turn the Right Motor on in the Reverse Direction
   Output_On_Reverse(Right_Wheel);

   -- Wait for 1000 hundredths of a second
   Wait(1000);

   -- Turn both motors off
   Output_Off(Left_Wheel);
   Output_Off(Right_Wheel);

   -- Tell the display to show the light sensor.
   Select_Display(Display_Sensor_2);
end C5D;
```

Code for A, B, & C (2 pts)

Code for B (1 pt)

Code for D (1 pt)

Code for A

Code for B (1 pt)

Code for C

Code for B

Code for D (2 pts)