Line Following

Take a large piece of paper (or tape smaller pieces together to make a big one) and draw a shape on it using a thick black marker. This shape will be your racing track.

Put the robot on top of the line and turn it on. It will scan the floor to detect the line. When it finds the line, it will start following it the path.

Compete with other robots to see which one makes it faster!

Hardware Required

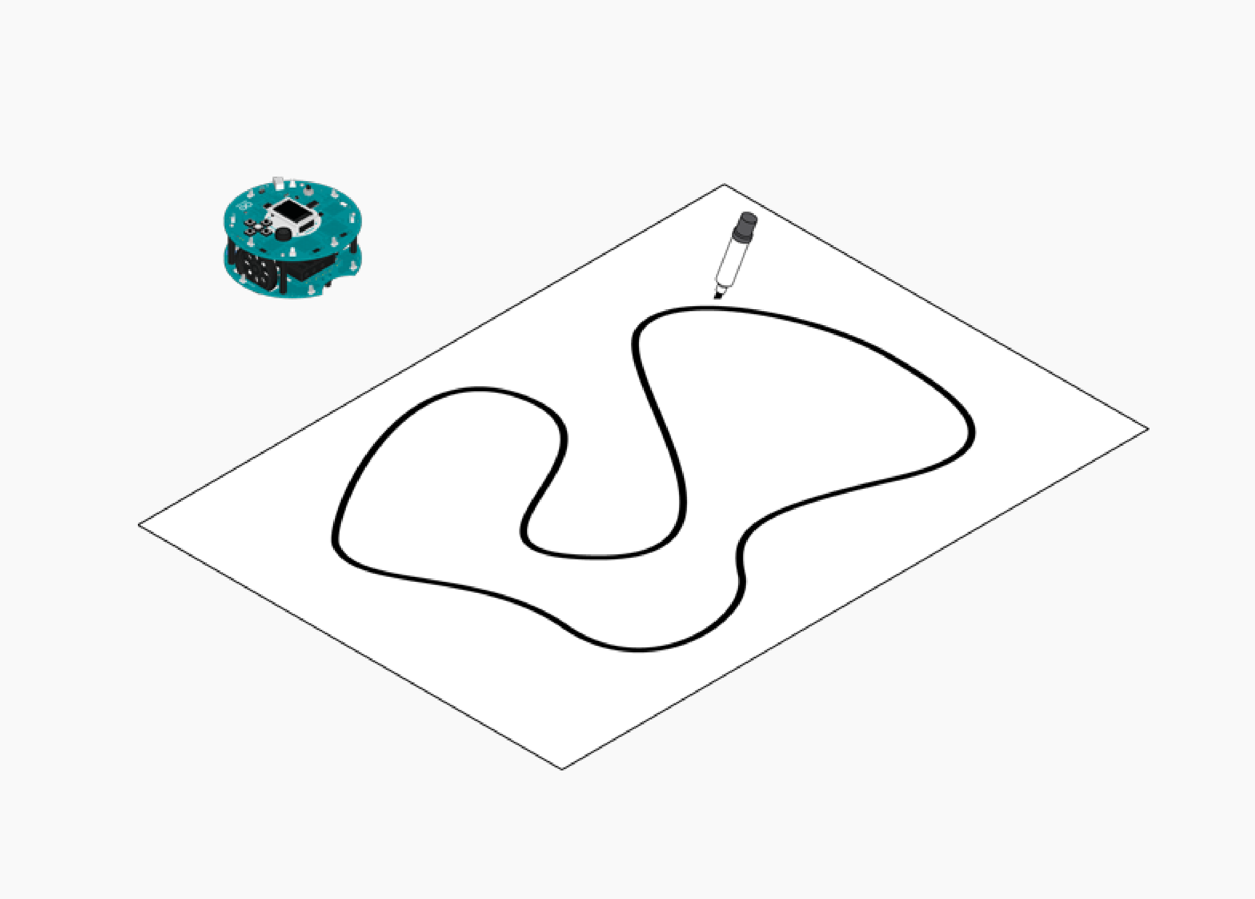
- Arduino Robot
- Large piece of white paper
- Thick black marker
- tape

Instruction

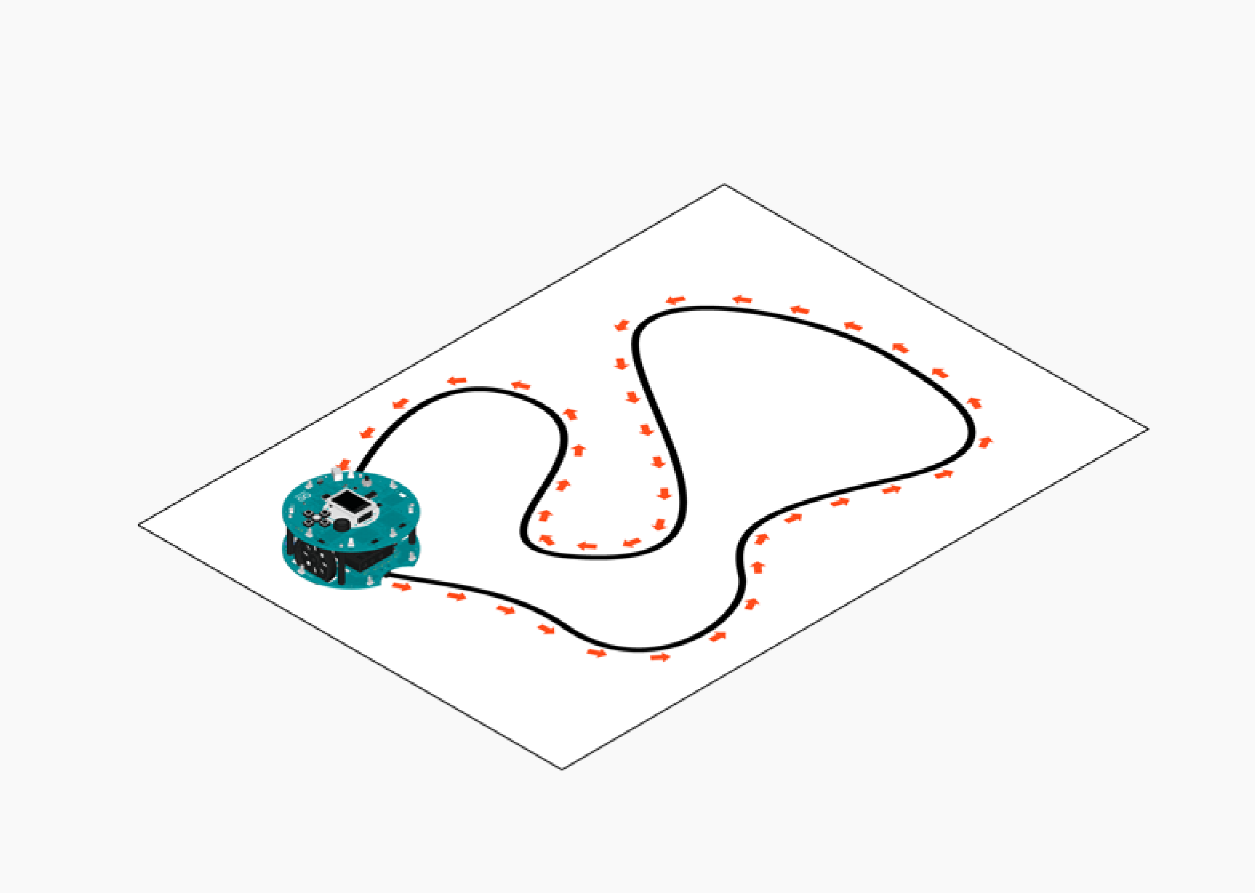
1. Prepare the track. Draw a thick line on soem white paper, making sure the ends of the line goes together. Use multiple pieces of paper if one is not big enough. The line should be around 3cm (1 inch) wide.
2. Tape the paper to the ground so the robot will not cause the paper to slip. The surface should have light color.
3. Upload the example, unplug USB and turn on power.
4. Place the robot on the track, so it is facing down the line.

5. After the starting screen, the robot will calibrate itself. It'll wag around a few times, detecting the line.
6. The robot will start following the line. If everything goes OK, it'll be continuously going around the track. If the robot goes off the line, see lineFollowConfig() for details about how to calibrate it.

Try it out



Draw your own racing track



Let your robot run the race!

Code

```
/* Robot Line Follow

 This sketch demonstrates the line following capabilities
 of the Arduino Robot. On the floor, place some black
 electrical tape along the path you wish the robot to follow.
 To indicate a stopping point, place another piece of tape
 perpendicular to the path.

 Circuit:
 * Arduino Robot

 created 1 May 2013
 by X. Yang
 modified 12 May 2013
 by D. Cuartielles

 This example is in the public domain
 */

#include <ArduinoRobot.h> // include the robot library
#include <Wire.h>

long timerOrigin; // used for counting elapsed time

void setup() {
  // initialize the Robot, SD card, display, and speaker
  Robot.begin();
  Robot.beginTFT();
  Robot.beginSD();
  Robot.beginSpeaker();

  // show the logots on the TFT screen
  Robot.displayLogos();

  Robot.drawBMP("lf.bmp", 0, 0); // display background image

  Robot.playFile("chase.sqm");  // play a song from the SD card

  // add the instructions
  Robot.text("Line Following\n\n place the robot on\n the track and \n see
it run", 5, 5);
  Robot.text("Press the middle\n button to start...", 5, 61);
  Robot.waitContinue();

  // These are some general values that work for line following
  // uncomment one or the other to see the different behaviors of the
robot
  //Robot.lineFollowConfig(14, 9, 50, 10);
  Robot.lineFollowConfig(11, 7, 60, 5);


  //set the motor board into line-follow mode
  Robot.setMode(MODE_LINE_FOLLOW);
  // start
  Robot.fill(255, 255, 255);
  Robot.stroke(255, 255, 255);
  Robot.rect(0, 0, 128, 80); // erase the previous text
  Robot.stroke(0, 0, 0);
  Robot.text("Start", 5, 5);

  Robot.stroke(0, 0, 0); // choose color for the text
  Robot.text("Time passed:", 5, 21); // write some text to the screen

  timerOrigin = millis(); // keep track of the elapsed time

  while (!Robot.isActionDone()) { //wait for the finish signal
    Robot.debugPrint(millis() - timerOrigin, 5, 29); // show how much time has passed
  }

  Robot.stroke(0, 0, 0);
  Robot.text("Done!", 5, 45);
}
void loop() {
  //nothing here, the program only runs once. Reset the robot
  //to do it again!
}
```

[Get Code]

How it works

The Robot has five infrared sensors on the bottom of the motor board that detect where light reflects back. That information is be used to decide whether to continue straight or to change the wheel speeds to turn.

Stopping

When the robot detects a black shape covering all the five sensors at once, it will stop. Use this feature to create tracks for the robot to stop and perform actions.