# Project 3 - Stage 3

Goal: Use the light sensor and behavior-based robotics to design and implement a line-following robot.

## Step 1

- Study and run the application `LightSensorTest2.java`, posted along with this handout on the public course web site under "Course Handouts" in the Project 3 section.
  - Become familiar with how the light sensor behaves in this application -- run it several times, try setting your robot on surfaces that are different colors, etc.
  - Include all participating team members' names in an: `@author implemented by...` line in the class' opening javadoc comment.
  - Submit your resulting `LightSensorTest2.java` with a homework number of `33` (be sure that you submit this BEFORE continuing to Step 2).

## Step 2

Consider the following line-following scenario and specifications:

- Your robot's ONLY sensor is a light sensor, facing downward, as in steps 22-23 and pages 32-34 of the basic Lego Mindstorms NXT robot instructions booklet.
- Your robot must use behavior-based robotics (as implemented using the `lejos.robotics.subsumption` package) to determine its behavior -- the only external/human assistance permitted are:
  - the initial button pushes and human actions needed to calibrate its light sensor
  - placement as described below to start following the line
  - an additional button push to start the robot moving along the line
- Imagine a "floor" of white paper with a thick black line on it -- let's say the black line is at least 6 inches wide, and hopefully several yards long.
  - Your robot is placed at the near end of the thick black line,

    facing AWAY from you,

    on the LEFT edge of that line,

    such that its LEFT tire is on the white "floor"

    and its RIGHT tire is on the thick black line.
  - You want the robot to follow this line from beginning to end. What behaviors will help your robot to achieve this goal?
  - We will be curious to measure:

    how long it takes to get to the end of the line (if possible);

if applicable, how many interesting occurrences/"catastrophes"/occurrences-needing-human-intervention occur along the way;

if it, ah, has to be stopped along the line, WHERE it had to be stopped and HOW LONG it took to get to that point.

You will also be submitting the source code for your behavior classes, in files named `Behavior<Description>.java`, and the source code for your application calibrating your light sensor and setting up and starting the arbitrator for your line-following robot, in a file named `LineFollower.java`, with a homework number of `33`.