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**Descriptions**

**Overall**: The value from the light dependant resistor (LDR) is used to control a game, a graph and LEDs on the breadboard. The game and graph are shown in a split-screen view on the PC.

In the game, the player controls a robot. The vertical position of the robot corresponds to the LDR reading (greater readings correspond to greater height). The objective of the game is to avoid a collision between the robot and oncoming pipes.

The graphs visualises the LDR reading, and is independent from the game (i.e. when the game is over, the graph still displays LDR readings).

**Arduino**: The Arduino application stores analogue input from the LDR. Then, the program outputs the LDR input to the serial port.

Three different coloured LEDs are located on the breadboard. At any given time, one LED is switched on. The colour of the lit LED corresponds to the LDR reading.

**Processing**: The Processing application runs the game and graph simultaneously. The LDR input from the Arduino is continuously read and updated from the serial port.

The game: The LDR input is used to control the height of the robot in order to avoid oncoming pipes. At the very beginning of the game, multiple LDR readings are taken to find the median LDR reading. This reading will correspond to the robot being at the top of the canvas. Pipes of random height are continuously generated and are programmed to continuously move towards the robot. If a collision between the robot and a pipe occurs, the game ends and the player is allowed to restart the game by clicking ‘r’. The score increases by 1 point every time the robot successfully avoids a pair of pipes, and the goal of the game is to attain the highest score.

The graph: The live LDR input is visualised on the graph.

**How to Set Up and Run**

1. The circuit must be connected as shown in the diagram below.
2. Open the .ino file using the Arduino IDE and upload the .ino file to the Arduino through the Arduino IDE.
3. Open the .pde file using the Processing IDE and run the .pde code in the Processing IDE.
4. At program start, allow the program to calibrate the median LDR reading. During this time, you will see a grey screen. Do not cover the LDR during this time. This will only take a couple of seconds.
5. Once the game loads, control the height of the robot by moving your hand closer or further away from the LDR.
6. Observe the graph.
7. If the surrounding light is too dim, shine a torchlight onto the LDR during the program’s calibration period, then move the torchlight closer or further away from the LDR to control the robot.
8. If a collision between the robot and pipes occurs, press ‘r’ to restart. Make sure the window is active by clicking anywhere on the canvas before pressing ‘r’.

