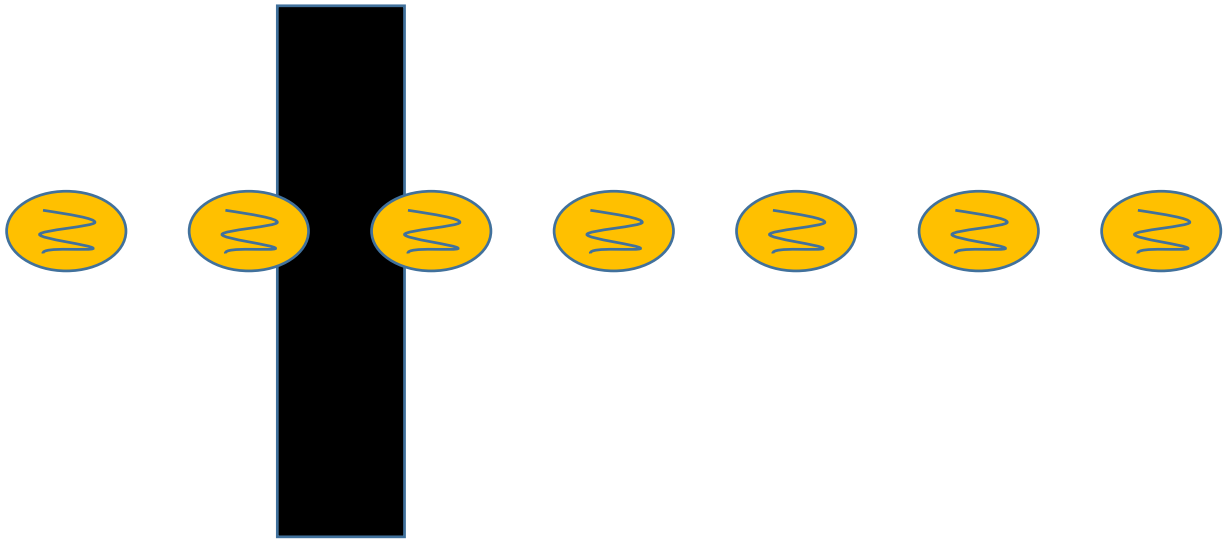
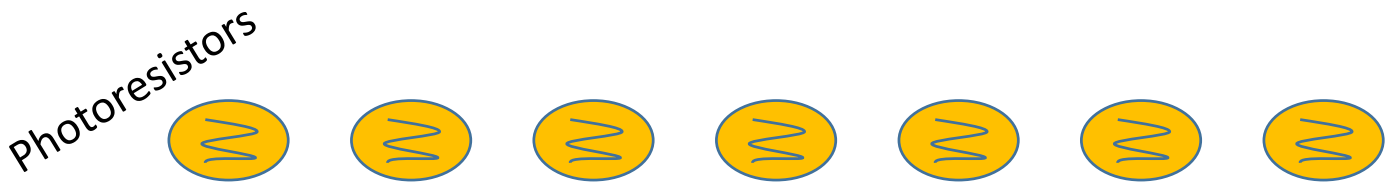
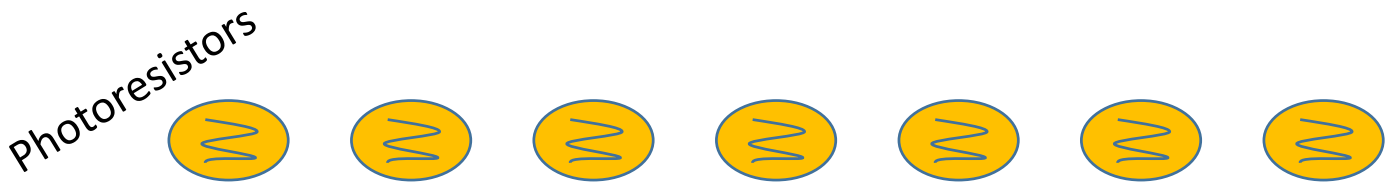


Calibration & Error Calculation

ECE 5 - Lab 4



- What we know we can do:
  - Read 7 values with analogread() ranging in values from 0 – 1023
- Questions needing answers:
  1. When is a photoresistor over a black line or a white surface?
  2. How do I quantify the error… what is error?



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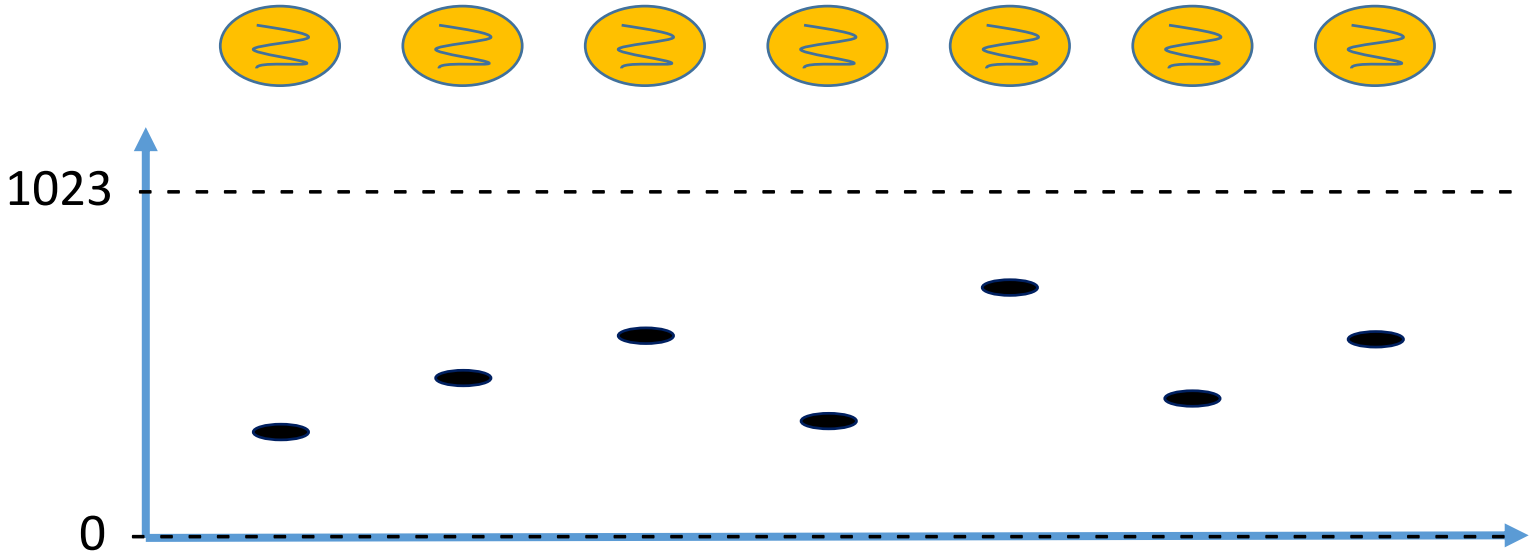
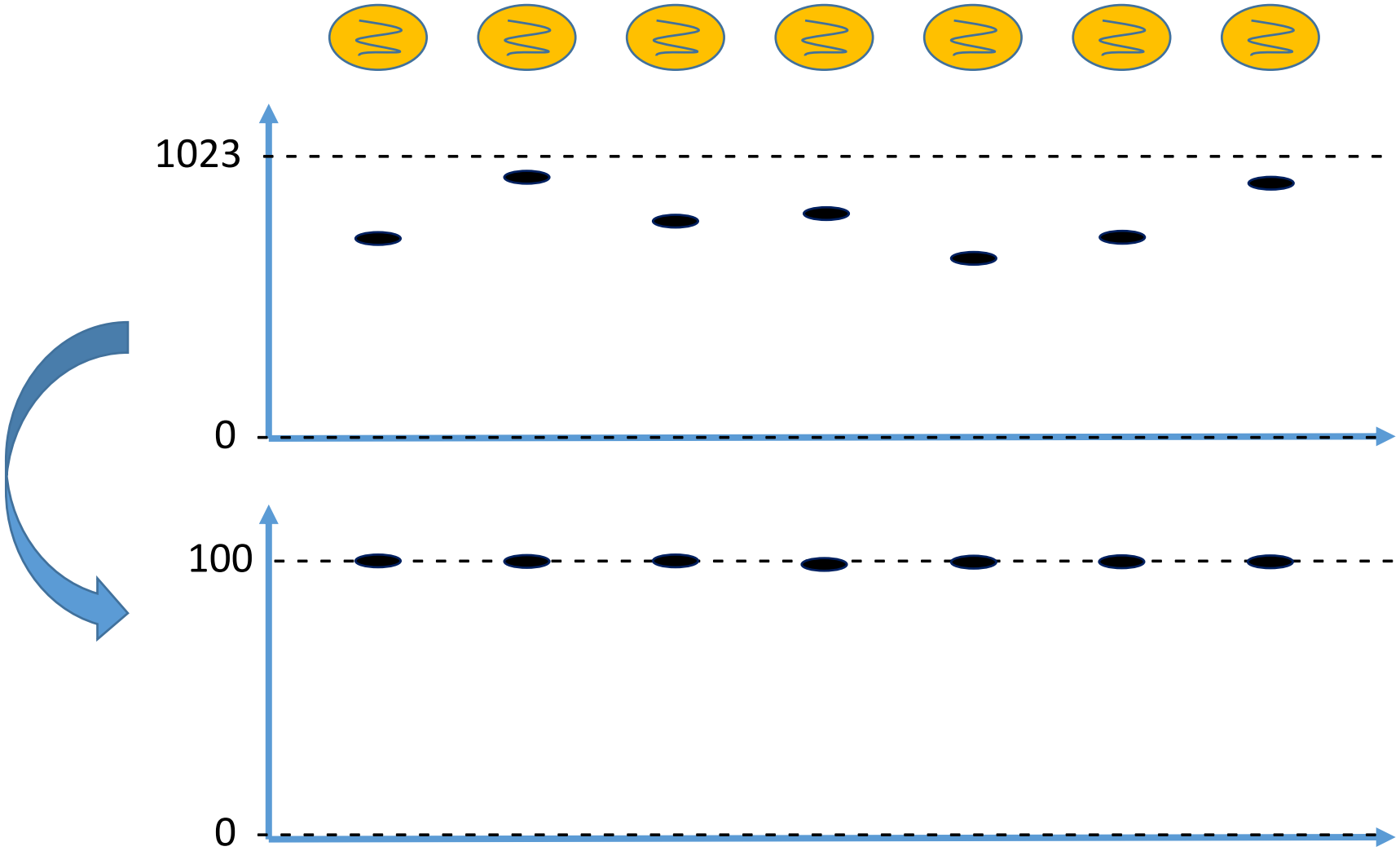
Calibrate!



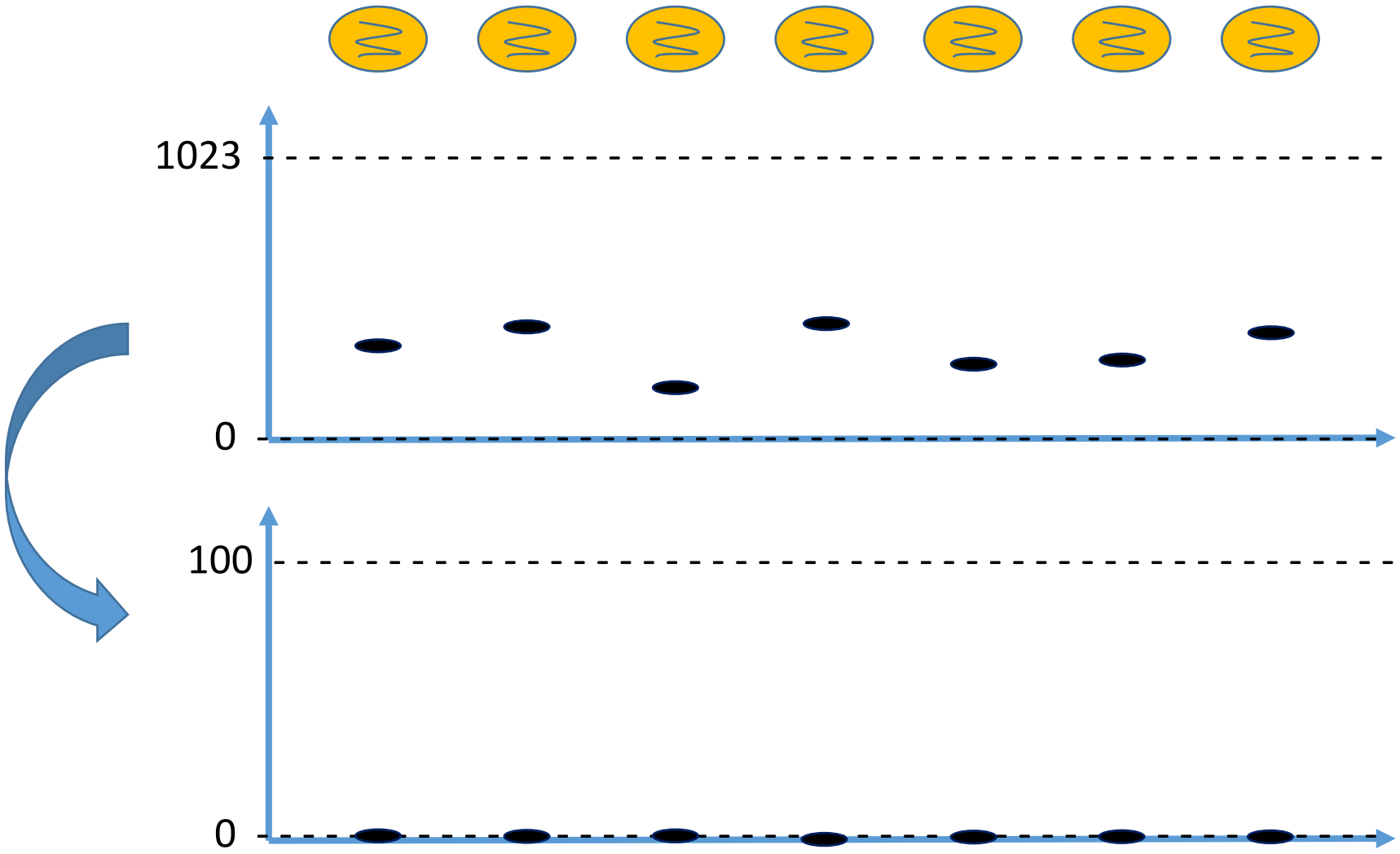
Remember these photo resistors get read by your Arduino as an integer between 0 and 1023.
But what is black and what is white?

Calibrate! - Black

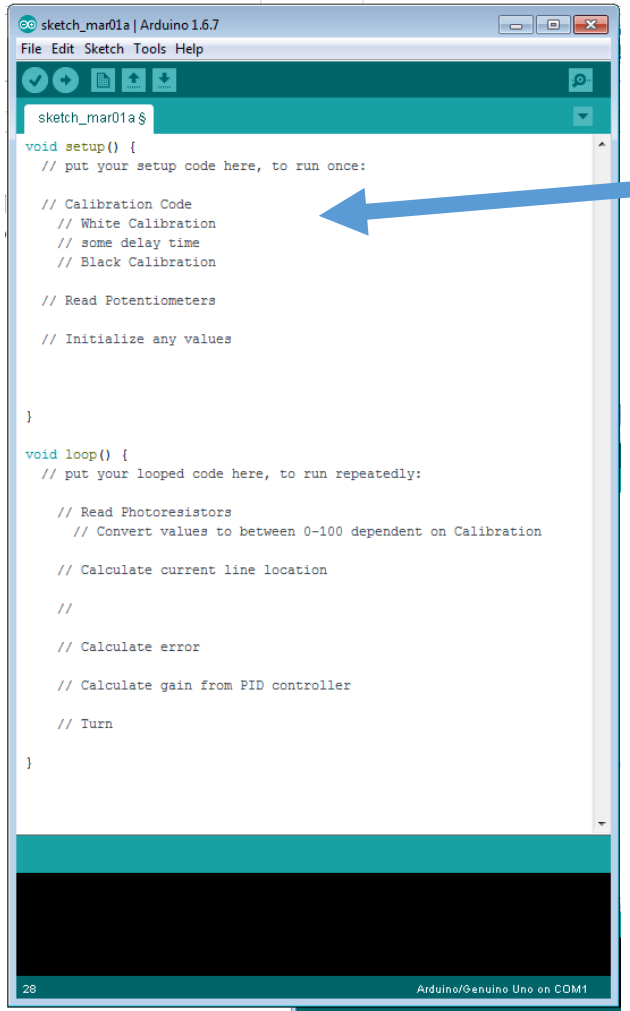


Map From Read values to a value from 0 – 100. Look at Lab #4 for more help.

Calibrate! - White



Calibrate! - When



Calibrate once at the very beginning in the setup{} function.

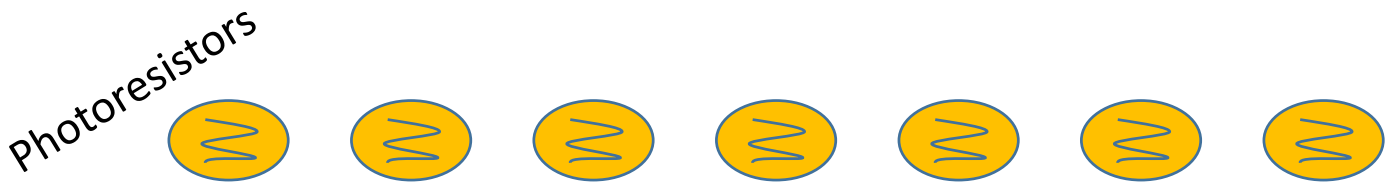
There are many ways to do this.

One way is to first move the photoresistors over an all white surface. Collect 5 seconds of of samples (maybe use for loop and then take average of all samples for each photo resistor).

Allow 5 seconds to move photoresistor over an all black surface (maybe blink LED pin 13 or your own LED during this time so you know you can move it).

Collect 5 seconds of samples while over the black surface similar to the white)

Then execute the rest of your code!



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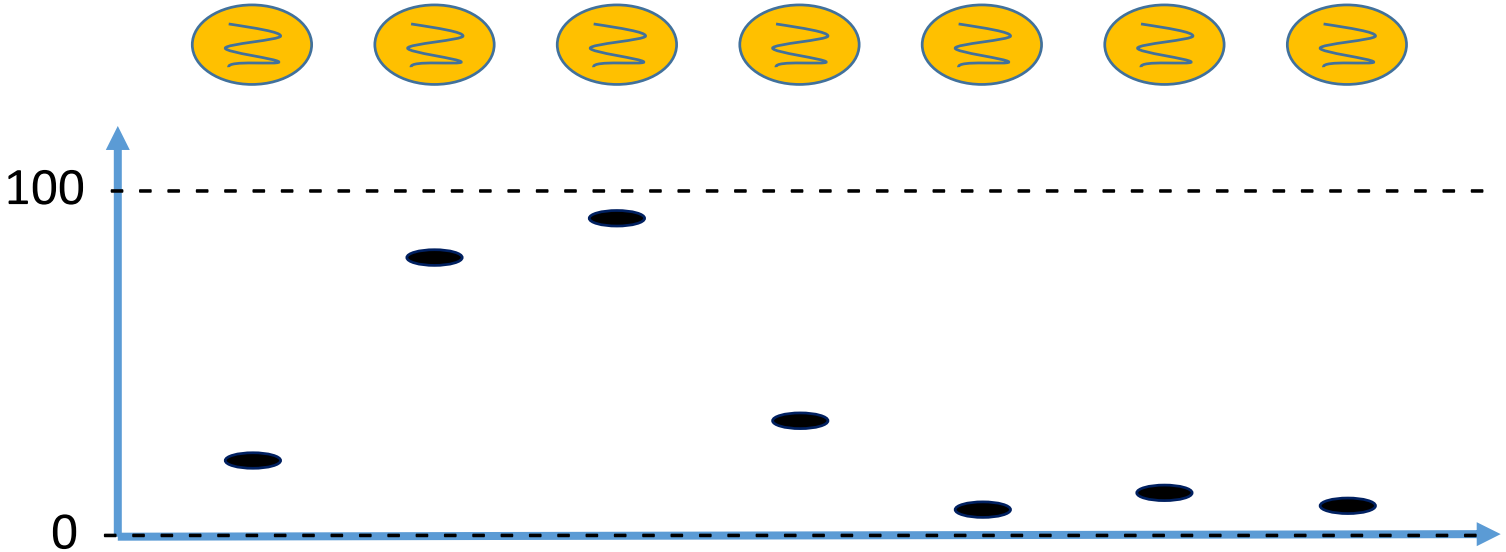
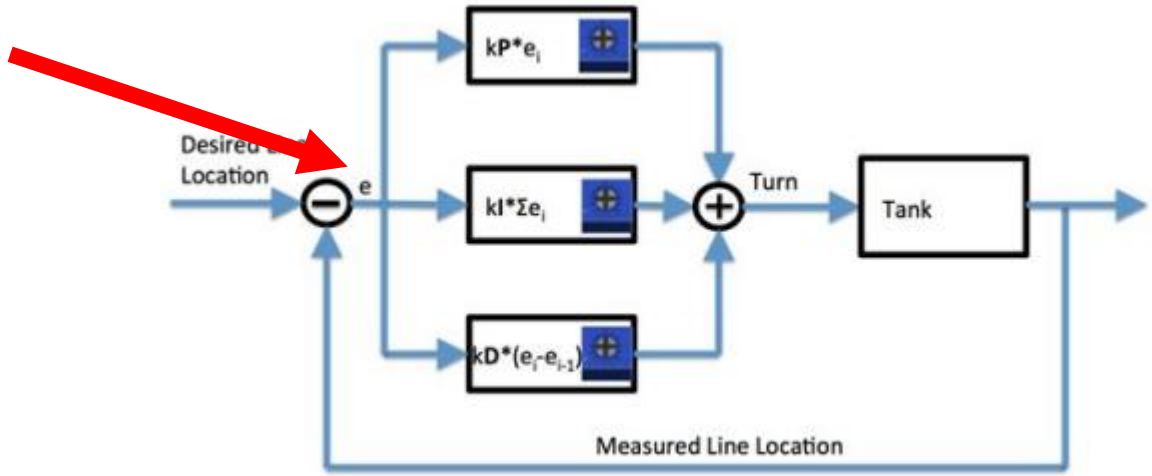
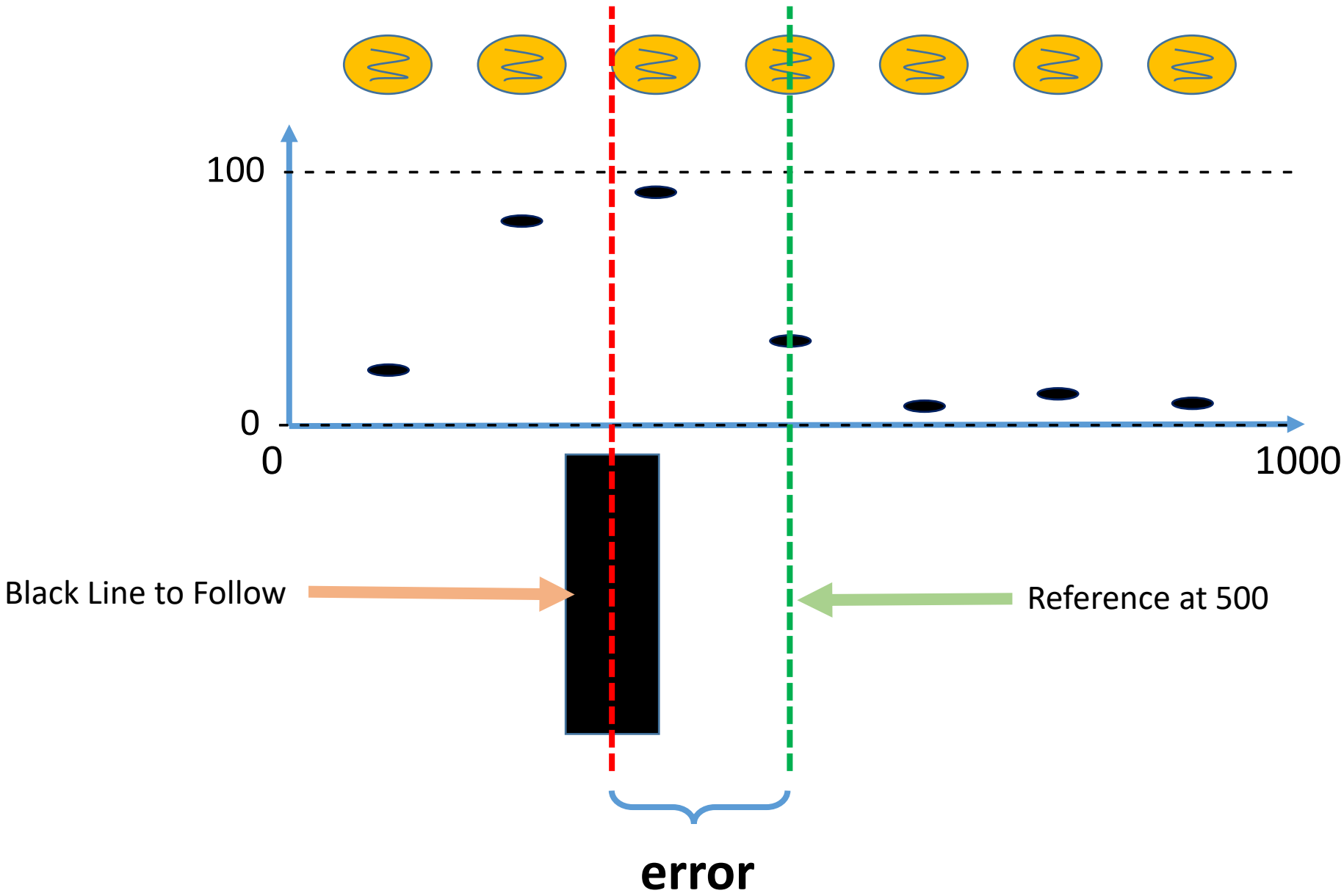
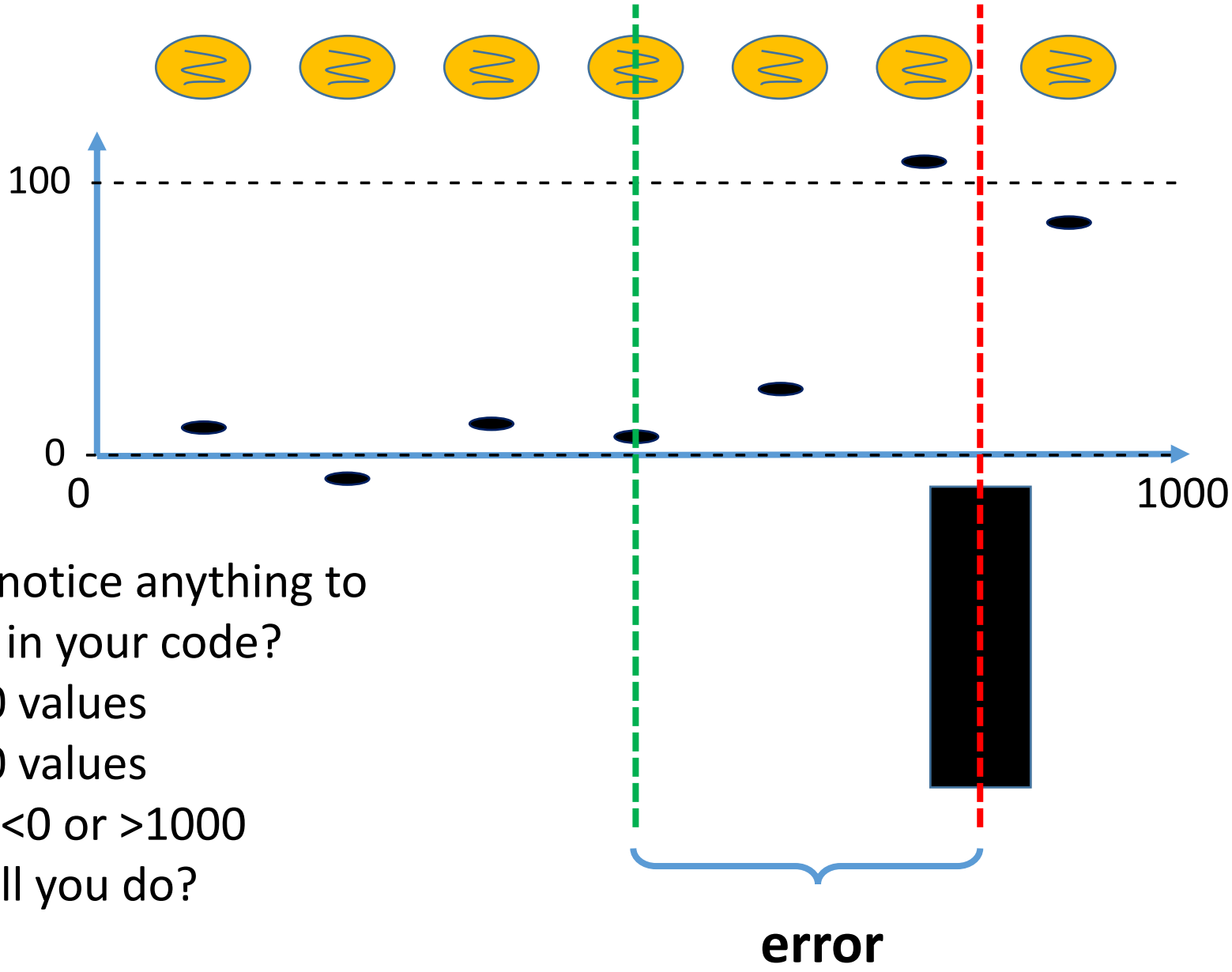


How do you get error (e)?




100
0
0
1000
Black Line to Follow
Reference at 500
error



- Can you notice anything to consider in your code?
  - <100 values
  - >100 values
  - Line <0 or >1000
- What will you do?