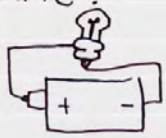
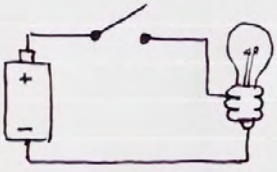
CoGS 300 Movement 01

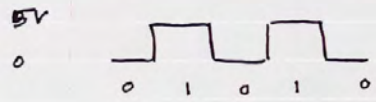
Last time:



if you break this connection, the light goes off.



If we do that on purpose, it's a button or switch.

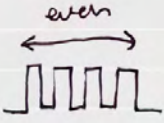


1 True High on
0 false Low off

How do we know which pattern?

0 1 0 1 1 1 0 1 0
00 11 00 111111 00 111 00

→ Timing



You need an encoding scheme to convey information.

You can read using digitalRead(pin)

→ activity: digitalRead w/ Switch.

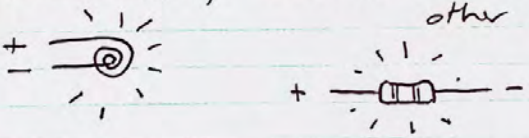
This brings us to the end of "12" material.

Open Circuits book (pass around)

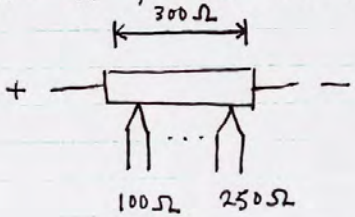
A potentiometer is a variable resistor.

$V = IR$ the resistor resists current flow (dissipate as heat)

think heating element in a stove or other heater



If we rip open the resistor and put a probe on it:



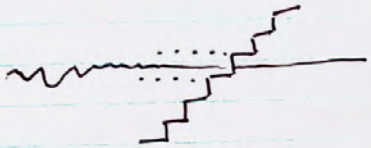
① now, bend it →

And you've got a potentiometer!

★ Demo

We can analogRead(pin) from the A- pins.

Inside the chip are voltage comparators. There are 1024:



is the signal higher than i and lower than i+1?

so you can detect 1024 levels.

$\frac{5V}{1024}$ = roughly 0.005 V changes.

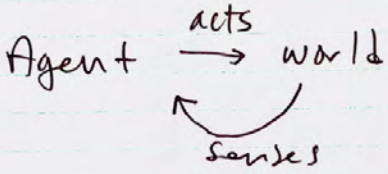
pretty good!

potentiometer is the model sensor.

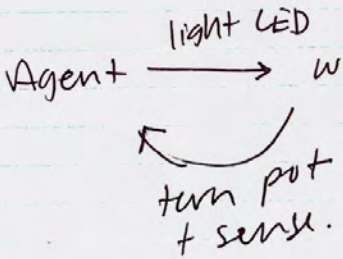
If you ever forget how a sensor works, think "potentiometer"

Demo activity pot + led.

Agent ↔ world loop

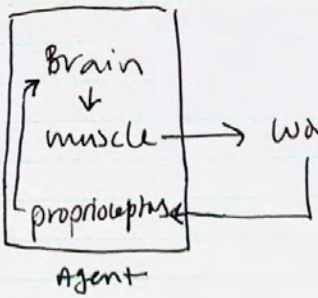


In our stuff today so far, the causal link is ... you



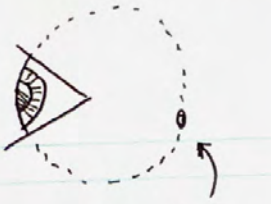
But soon you will sense things you acted more obviously on, like a motor + wheel.

This is a very simple model. It's only a high-level view. eg.



do we even need "world" for some actions?

photocell demo.



photocell activity.

also a good model sensor!

If time: Design a night light.

Q: is a switch a sensor?

We'll see this soon, but switches are used in many sophisticated ways to sense things!

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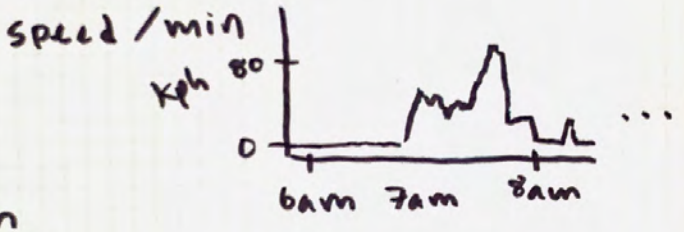
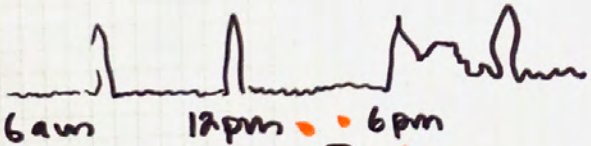
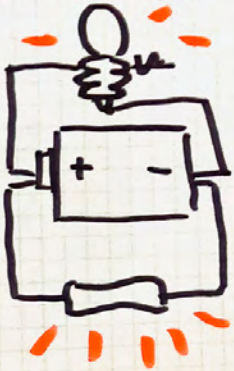
WARM UP: Draw a set of lines that tell a story about your life.

eg.



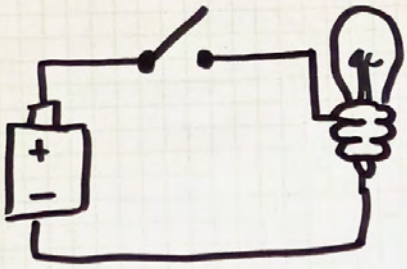
Time on YouTube

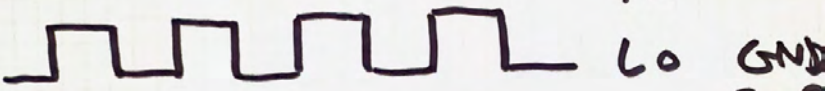




$V = IR$

0.00





1 0 1 0 1 0 1 0

T F

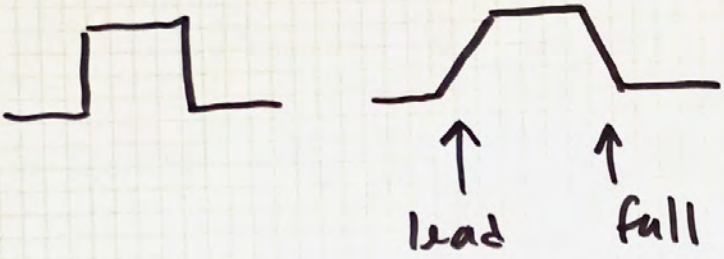
W in time

0 1 0 0 1 1 1 1 0 0 1 0 0

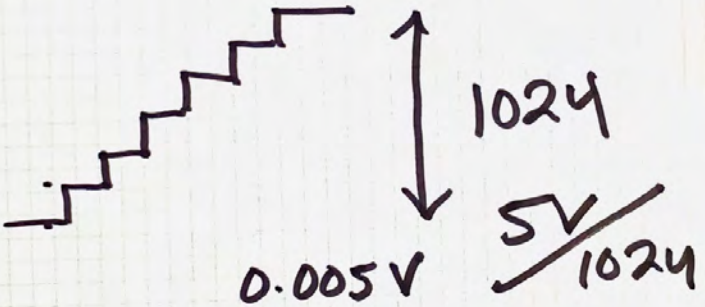
?

Encoding Schema

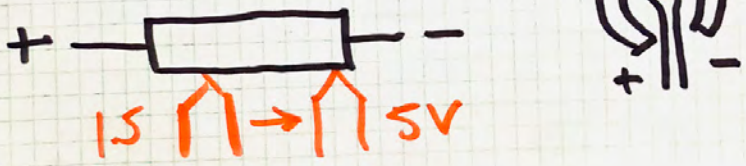
digital Read (pin)



analogRead(pin)
digitalRead(pin)



potentiometer



act
Agent → world
sense