Picobot assignment

- Approaching something new…
  - What was your strategy?
  - How did it work out?
  - Did you try different approaches?

- Low-level: Thinking like the machine
  - Mental *simulation*
  - Example: the sample rules

- High-level: *Algorithm* first
  - What are the steps, rules to follow?
  - Discussion: the corners problem

Computational Thinking

▸ Computers are very limited

  ▸ They can only perform a very small number of operations

  ▸ Storing and retrieving information, and arithmetic

  ▸ …but they can do it really, really fast

▸ Key concept: *Abstraction*

  ▸ Millions of simple operations can do complex things

  ▸ Abstraction is focusing on a certain level of detail, and ignoring the rest

  ▸ Humans are able to identify the right level of detail for a task, which is what makes us much smarter than computers

▸

Computational Thinking

‣ To instruct the computer, you have to think in it's terms (*computational thinking)*

‣ Key concept: *Automation*

 ‣ Computers execute instructions (programs)

  ‣ *Sequential execution*: one instruction after the next

 ‣ Program instructions are *unambiguous*

  ‣ They tell the computer to do exactly one particular thing

 ‣ Program instructions are made up by people

  ‣ Their "meaning" is only what they cause the computer to do

 ‣ Program instructions are at different levels of abstraction

  ‣ Allows you to program without specifying the lowest level of detail

‣

Assignment

- Back to the Roomba problem
  - Write rules to cover the whole room
  - How efficient can you be?
    - How many states? How many rules?
    - How much redundant coverage? (going back over the same squares)
  - Is the room full or empty?