

Why Johnny Can't Program

Using toy robots to
teach programming.

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Follow a Line

Goal: program a robot to follow a line

The Line

- 2" solid black line on a white background

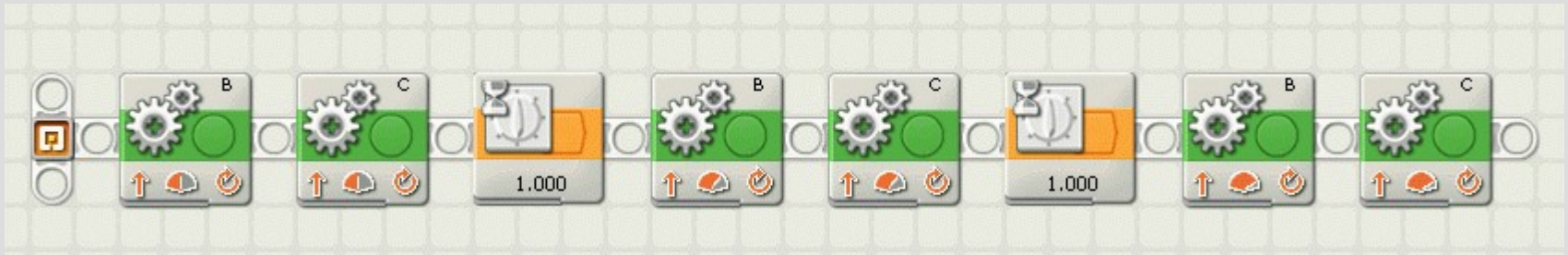
The Robot

- Two motors
 - Left
 - Right
 - Forward only
 - On/Off
- Light Sensor
 - Black or White

Elements of Programming

- Grammar
- Reading/Writing
- Arithmetic
- Language, Syntax
- I/O, RAM, Hard Disc
- CPU, Pentium, Processor

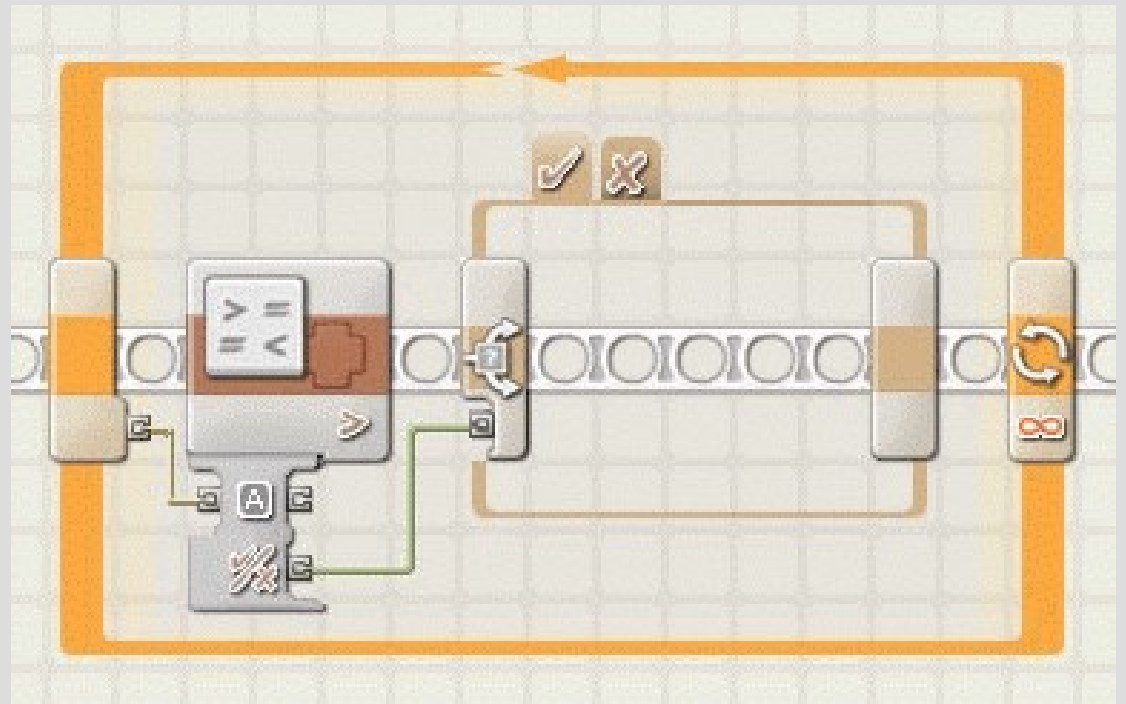
Sequence



- List
- Example:
 - Put on socks
 - Put on shoes
 - Tie shoelaces
 - Walk

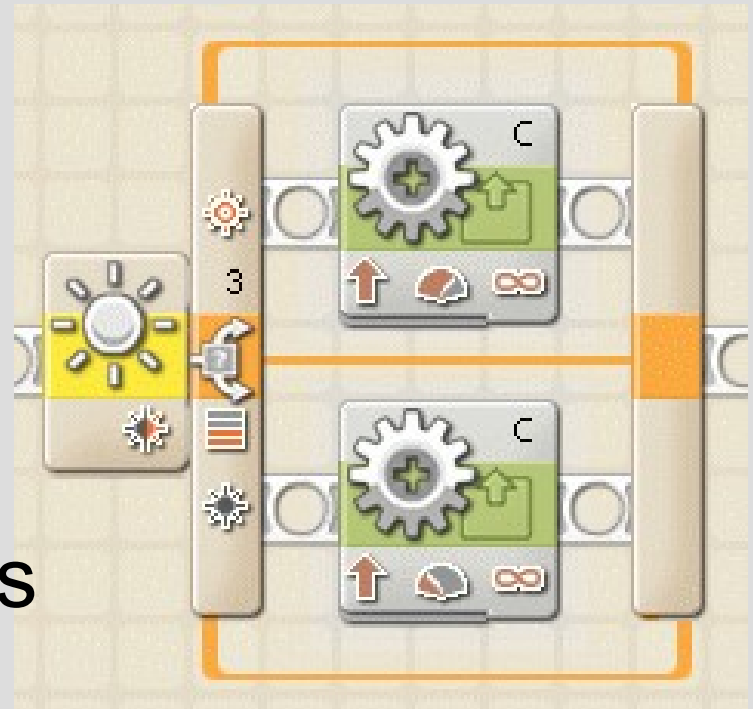
Repeat

- Do it again
- Example:
 - Wake up
 - Tie Shoes
 - Go to Work
 - Repeat until the weekend



Decide

- Pick
- Example:
Start with the left shoe
Choose the brown socks



That's all there is.

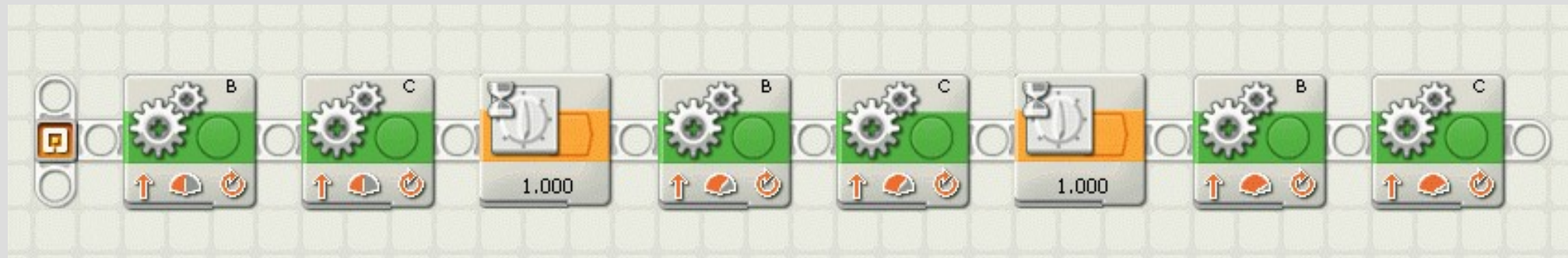
- Simple ideas
- In use every day
- Liar!

Library

- Already written
- Don't re-invent the wheel
- Examples:
 - Motor Forward Forever
 - Motor Stop
 - Read Light Sensor

Review - Sequence

- Motor B or C
- Speed 50, 75, 100%



- Wait for 1 second

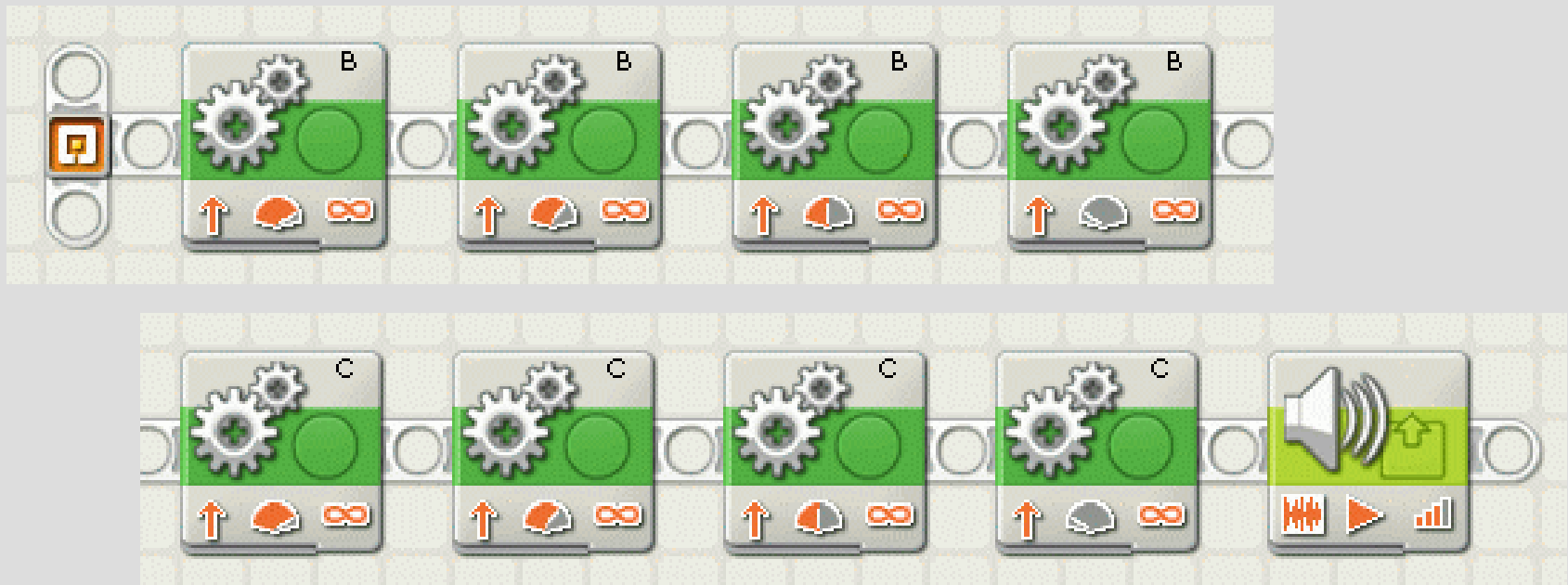
Review – Sequence 2

- C and B, Forward, 50% power, runs forever



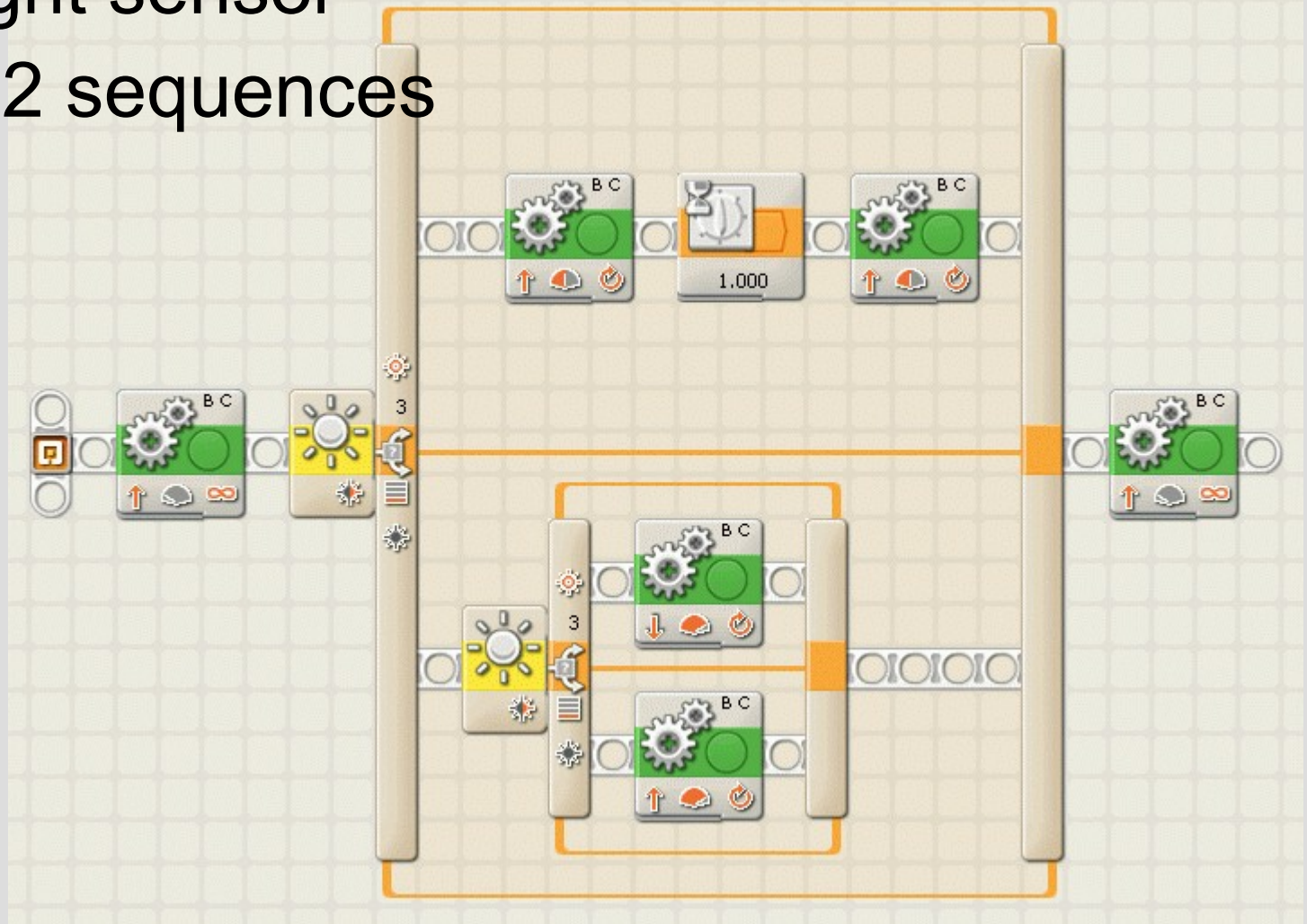
Review – Sequence 3

- What do you expect?



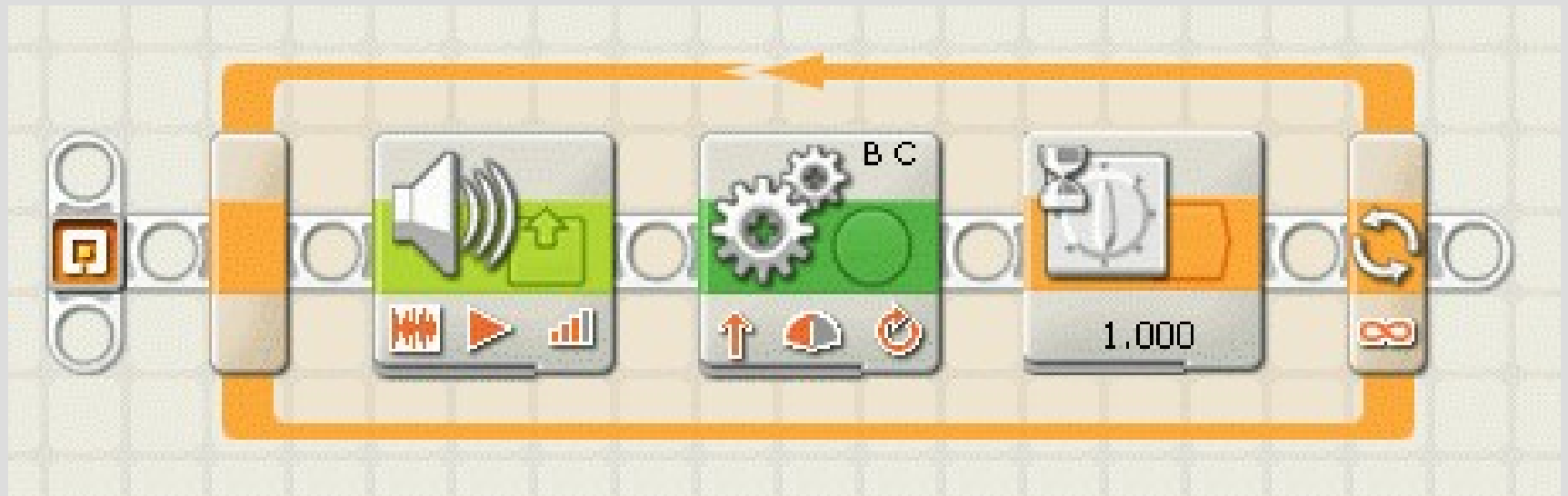
Review - Switch

- Test a light sensor
- Creates 2 sequences

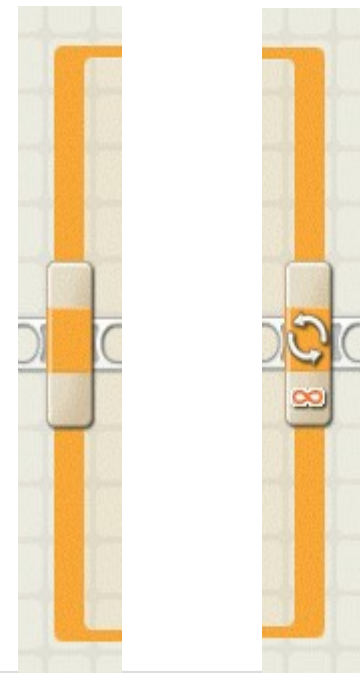
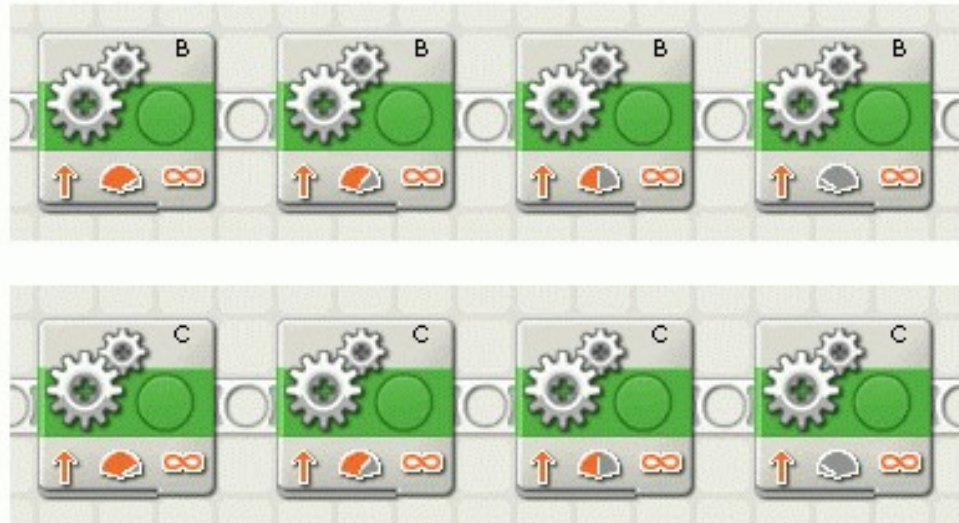
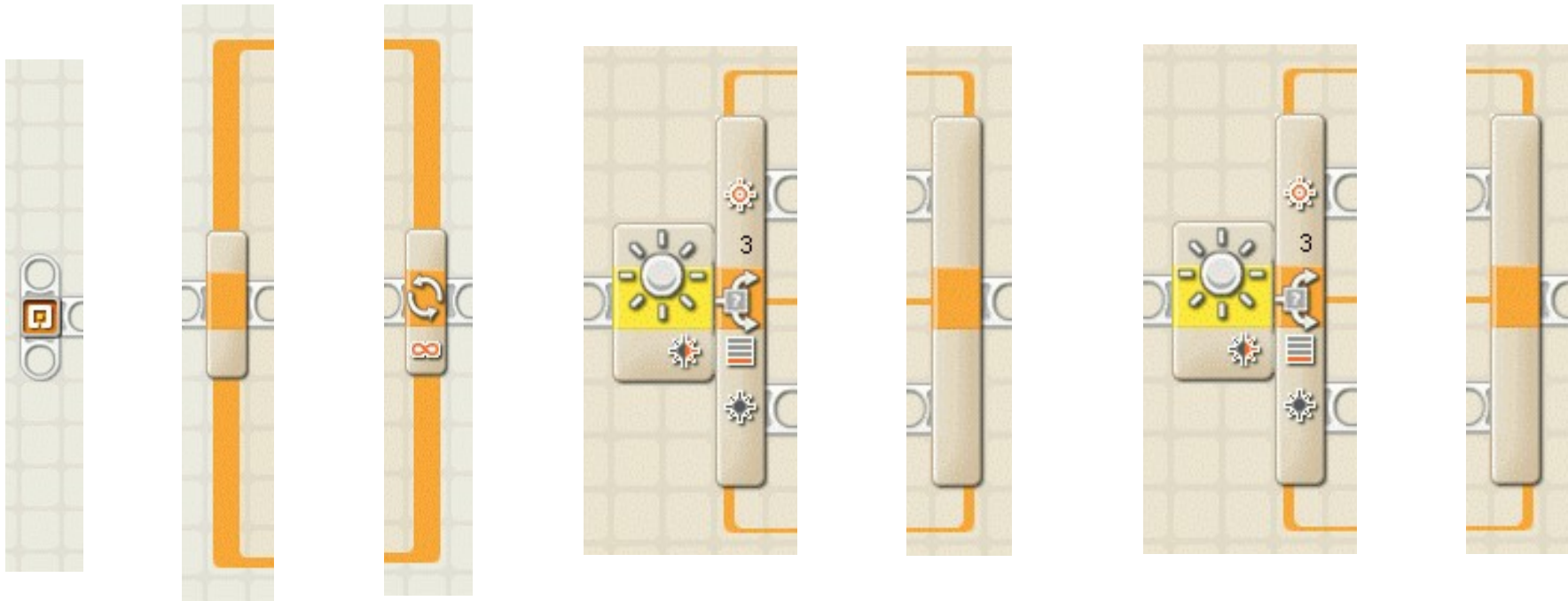


Review - Loop

- Infinite Loop



The pieces



Why was that difficult?

- How can a robot follow a line?
- Solve the problem, then write the program.