**Topics:** Loops, Variables, Conditionals

**Approach:** Study Problems, Create and Discuss Solutions

**Main Ideas:**

0. Prologue/Principles
   - Laziness, Impatience, Hubris
   - There’s more than one way to do it
   - What do these have to do with loops and variables?

1. Admin
   - HW2 part 1 Due
   - Find a script buddy now
   - Office Hours: Tu 6-9, Thu? Wed?

2. Loops, Conditional Statements, Variables
   - a. Compare the 9-line lowest finder to the 2-line version
   - Anatomy of loops and conditionals:
     - boolean expression, action
     - control line, loop variable, body
   - b. HW2 part 1: Repeating a repetition
   - c. Today we look at these topics in detail

3. Repetition with Variables in the real world
   - a. 99 bottles of beer
   - b. Junk mail
   - c. Old MacDonald
   - d. The big idea: A repeated pattern with some variation
   - e. Writing it out the long way vs using 'repeat'

4. The specific problems: Drawing various shapes
   - a. Using the pen in Scratch
   - b. pen up, pen down, pen color, clear, hide
   - c. Some shapes you might want to draw
     - squares, grids, flowers
   - How can one do this in simpler terms?

5. Repetition in the computer world
   - a. Drawing a square - eight lines vs three lines
   - b. Drawing a triangle, a pentagon, a hexagon, ..
   - c. Bunches of squares - a row of boxes
     - repeat until <___>
   - d. A grid of boxes
   - f. The big idea: a repeated pattern of code
   - g. Flowers of triangles, pentagons, ...

6. Variables: Many benefits
   - a. In the row of boxes, need to keep sides in sync
   - b. Also, meets the laziness principle
   - c. And hubris -- code is clearer

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