2.55 Consider the museum security alarm function of Exercise 2.53, but for a museum with 10 rooms. A truth table is not a good starting point (too many rows), nor is an equation describing when the alarm should sound (too many terms). However, the inverse of the alarm function can be straightforwardly captured as an equation. Design the circuit for the 10 room security system, by designing the inverse of the function, and then just adding an inverter before the circuit’s output.

**Step 1 - Capture the function**
_Skipped - we’ll use an equation directly._

**Step 2 - Convert to equations**

\[
A' = m9'm8'm7'm6'm5'm4'm3'm2'm1'm0' + m9'm8'm7'm6'm5'm4'm3'm2'm1' + m9'm8'm7'm6'm5'm4'm3'm2'm1'm0' + m9'm8'm7'm6'm5'm4'm3'm2'm1'm0' + m9'm8'm7'm6'm5'm4'm3'm2'm1'm0' + m9'm8'm7'm6'm5'm4'm3'm2'm1'm0' + m9'm8'm7'm6'm5'm4'm3'm2'm1'm0' + m9'm8'm7'm6'm5'm4'm3'm2'm1'm0' + m9'm8'm7'm6'm5'm4'm3'm2'm1'm0' + m9'm8'm7'm6'm5'm4'm3'm2'm1'm0'
\]

**Step 3 - Implement as a gate-based circuit**