**Reversible Classical Computing**

**Problems**
- How can a reversible classical circuit be modeled via modeling software?
  - Must work both forwards AND backwards
  - Maintain information throughout/no loss of information
- Can the model be achieved in the real world?
  - Same requirements, with real world limitations

**What is Reversible Classical Computing?**
- All information persists
- Able to reverse from output back to input
- Normal gates lose information
  - Via having 2 input and 1 output
- Reversible classical adder has persisting information
  - Via having equal inputs and outputs
- Halfway step between classical computing and quantum computing

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**Billiard Ball Model**
- Consists of billiard balls and various walls
- 1: presence of a ball, 0: no ball present
- Calculations come from collisions

**Half-Adder**
- Uses three AND Gates and an XOR Gate
- The first two Gates are AND Gates used with a control to duplicate the inputs

**Or Gate**
- Utilizes 4 gates to make an OR gate
- Two NOT Gates followed by an AND gate
- Another NOT Gate at the end

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**Lane Model**
- Uses Toffoli Gate, C-Not gate and Identity gate
- Sensor pads determine will the balls are at
- Doors open based off of the sensor data

**Comparison**
- **Billiard Ball**
  - Shows gate interaction
  - Requires extreme precision to work as intended
- **Lane Model**
  - More reliable
  - Requires sensors and motors