**Exercise 1**

Diagram

Description automatically generated

The LUT equation is: O = I0 & I2 + !I0 & I1 + !I1 & !I2

Equation Breakdown:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Partial Results** | | | **Final Result** |
| Partial Equ. | I0 & I2 | !I0 & I1 | !I1 & !I2 | I0 & I2 + !I0 & I1 + !I1 & !I2 |
| 000 | 0 | 0 | 1 | 1 |
| 001 | 0 | 0 | 0 | 0 |
| 010 | 0 | 1 | 0 | 1 |
| 011 | 0 | 1 | 0 | 1 |
| 100 | 0 | 0 | 1 | 1 |
| 101 | 1 | 0 | 0 | 1 |
| 110 | 0 | 0 | 0 | 0 |
| 111 | 1 | 0 | 0 | 1 |

This LUT equation uses three separate AND statements (all ORed together) to build a result.