|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **A** | **B** | **C** | **f() Boolean equation** | **AND/OR Circuit** | **NAND Circuit** |
| **0** | **0** | **0** | ABC | 1 | 1 |
| **0** | **0** | **1** | ABC’ | 0 | 0 |
| **0** | **1** | **0** | AB’C | 1 | 1 |
| **0** | **1** | **1** | AB’C’ | 1 | 1 |
| **1** | **0** | **0** | A’BC | 1 | 1 |
| **1** | **0** | **1** | A’BC’ | 0 | 1 |
| **1** | **1** | **0** | A’B’C | 1 | 1 |
| **1** | **1** | **1** | A’B’C’ | 0 | 0 |

The completed truth table shows that both the AND/OR circuit and the NAND circuit produce the same outputs, making them equivalent. The truth table represents the inputs and outputs of the simulated circuitry in Logisim. This is used to show that two different circuits yield exactly the same outputs, proving that an AND/OR gates-based circuit has the same outputs as a NAND gates-based circuit given the same inputs. Thus proving that NAND-only implementation of a Boolean function is functionally equivalent to an AND/OR implementation, due to De Morgan’s Law.