BBM233: Logic Design Lab
2023 Fall
Board Experiment #(1) Report

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1 Truth Table

Figure 1: Truth Table

From this truth table we get the equation by sum of products(Minterm method):
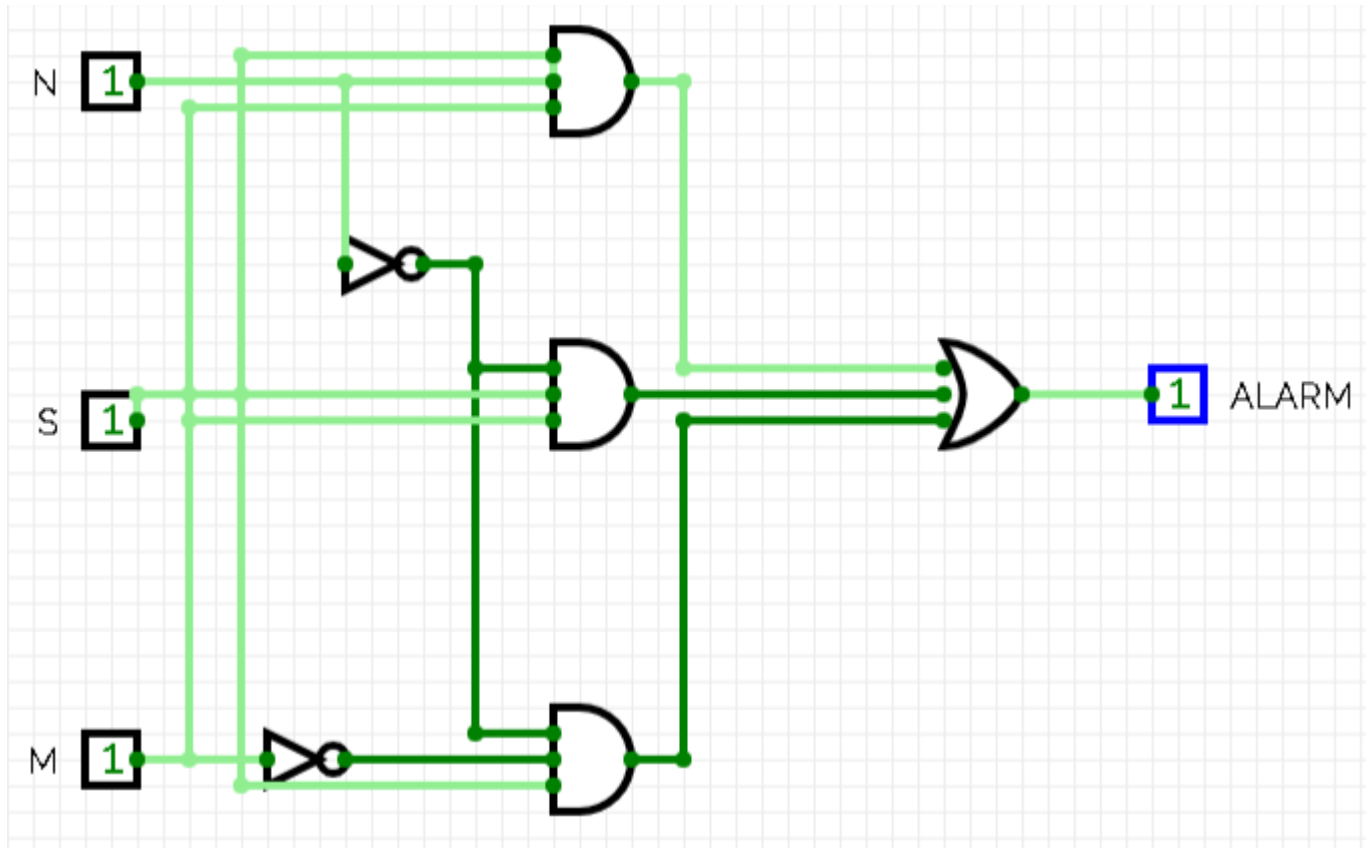Alarm(N,S,M) = N'SM + N'M'S + NMS

2   Circuit and Efficiency

Figure 2: Circuit 1

This is the circuit of equation: Alarm(N,S,M) = N'SM + N'M'S + NMS, but the thing is we can simplfy this equation and can make our circuit more efficient.

1. **Alarm(N,S,M)** = SM(N'+N) + SN'M'
2. **Alarm(N,S,M)** = SM+SN'M' = S(M+N'M')
3. **Alarm(N,S,M)** = S(M+(N+M)')
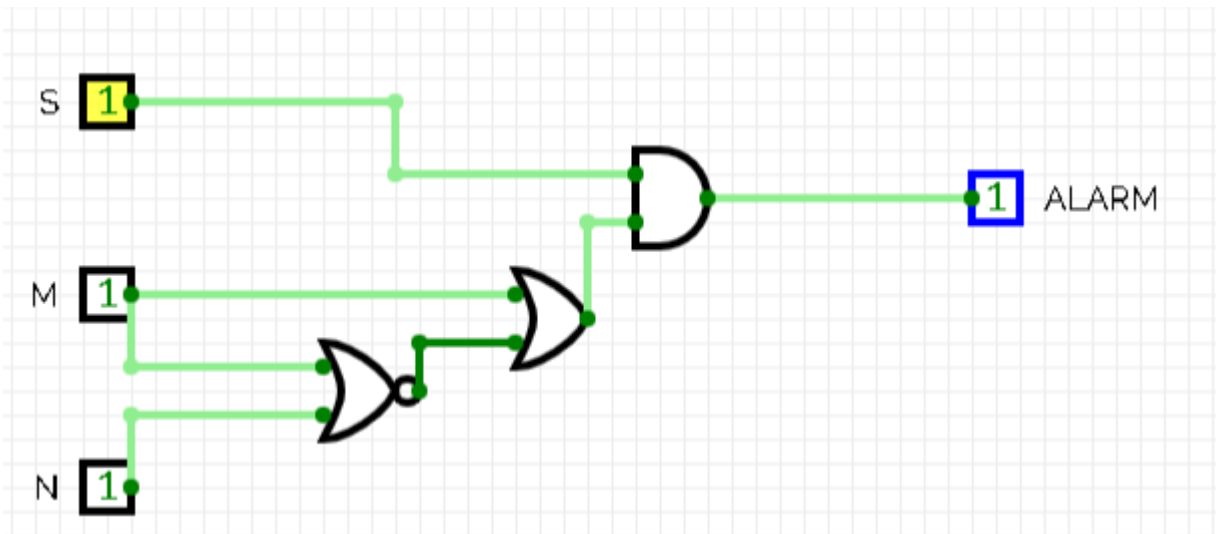
This is more efficient formula which we only use 3 gates.

Figure 3: Circuit2