Objective

The objective of this lab is to work on analyzing and designing counters using JK flip flops in order to obtain knowledge of the various types of sequential counters.

1 Introduction

Counters

Counters are a type of sequential circuit that will go through a set sequence of states.

Analyzing Counters

When analyzing a diagram of a sequential circuit, the first step is to label all the relevant out puts and inputs and build a state table from these. After the state table is made, make a state diagram of the circuit.

Designing Counters

When designing a counter is the same process as analyzing one except backwards. First based on the information given, create a state diagram, then from the state diagram create a state table and then finally after simplifying the function create a diagram.

2 Results

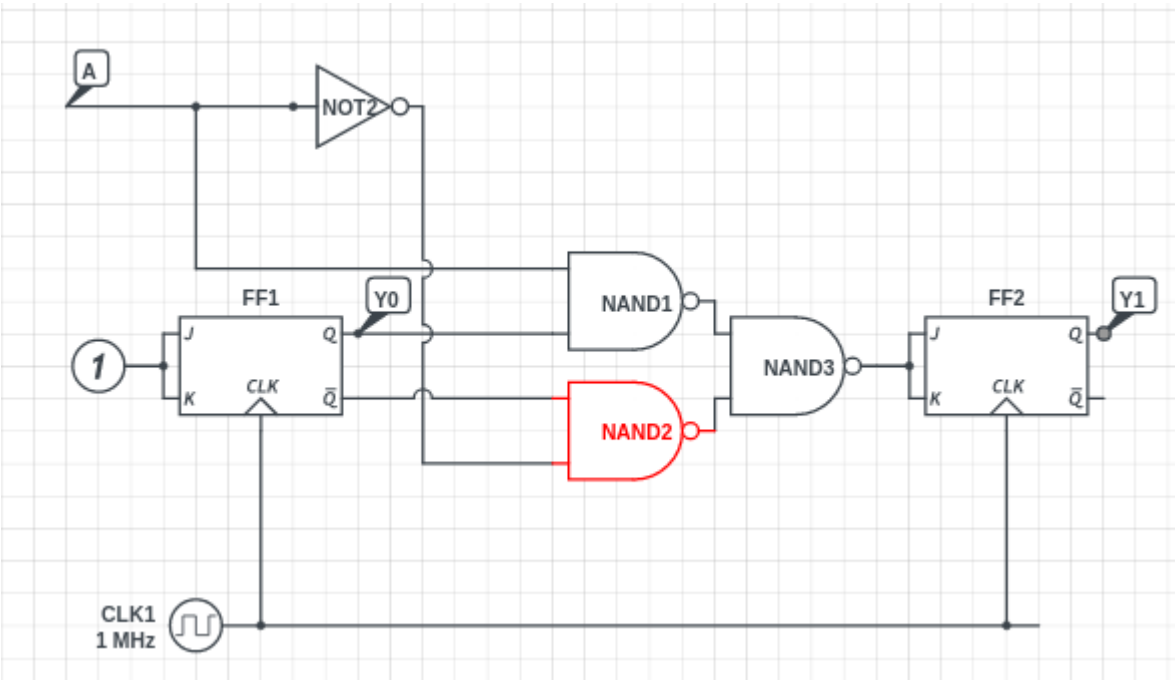

Figure 2.1: Depicts the logic schematic of the 2 bit counter developed in the lab.

In the lab we developed a 2 bit adder, the circuit schematic is depicted in figure 2.1. We used techniques used in the previous lab in order to effectively implement the IC properly.

3 Discussion

In the lab we used modular implementation in order to implement the combinational logic parts of the circuit. An issue that arose while implementing the circuit was an issue with a wire causing a short circuit which would cause all the voltage to skip the circuit built. This problem was solved by unplugging all the wires one by one and seeing which one was causing the short circuit to occur.

Designing a Circuit is much more difficult than analyzing a circuit since you do all the steps in analyzing a counter and design the schematic for the counter.

4 Conclusion

The objective of this lab is to work on analyzing and designing counters using JK flip flops in order to obtain knowledge of the various types of sequential counters. Counters are sequential circuits that are always changing to different states in a predetermined order. Analyzing sequential circuits follows 3 steps, where we first label our circuit schematic, then we transform it into a state table and then finally we create a state diagram. Designing a sequential circuit is the same process as analyzing one but in the reverse order. By using techniques used in previous lab we were able to easily created the circuit in Figure 2.1.