Abstract

Simulation of latch behavior using Raspberry Pi Pico to demonstrate NAND and NOR latch transitions for the input combinations (0,1) → (1,1).

1. Components

2. Setup

- GP15: Input P1 (Push Button)

- GP14: Input P2 (Push Button)

- GP16: NAND Q Output (LED)

- GP17: NOR Q Output (LED)

- GND and VBUS properly connected

3. Observation

- **NAND Latch:** $(0,1) \rightarrow (1,0) \rightarrow$ holds at $(1,0)$

- **NOR Latch:** $(0,1) \rightarrow (1,0) \rightarrow$ transitions to $(0,0)$
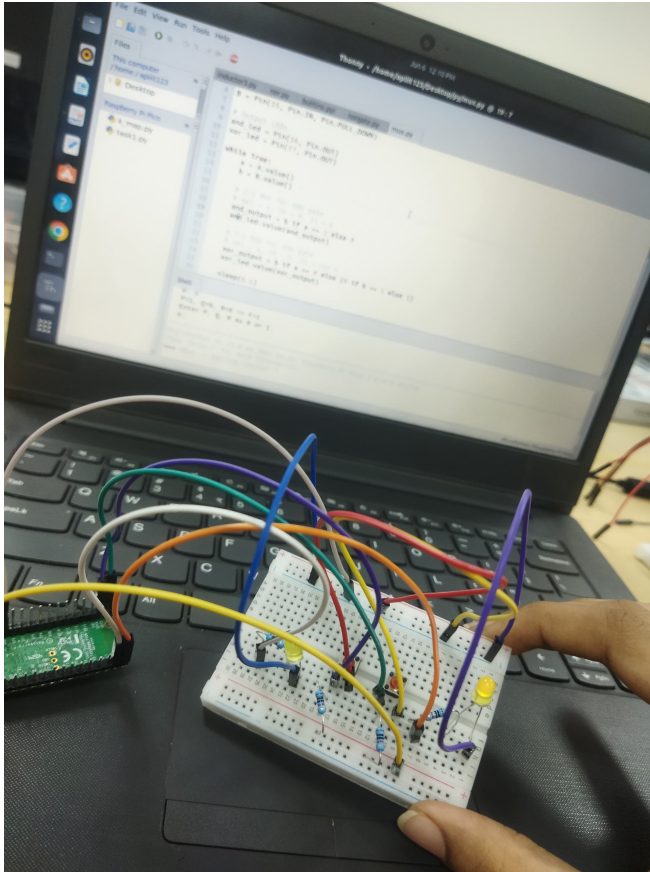
4. Truth Tables

NAND Latch

$P1$	$P2$	Output (Q1, Q2)
0	1	$(1,0)$
1	1	$(1,0)$ (holds)

NOR Latch

$P1$	$P2$	Output (Q1, Q2)
0	1	$(1,0)$
1	1	$(0,0)$

5. Circuit Image

6. GitHub Code Link

```
https://github.com/sathvi2710/fwc/blob/main/hardware/platformio/
plaformio.py
```

7. Conclusion

   This project successfully demonstrates latch behavior for NAND and NOR gates using MicroPython and Raspberry Pi Pico.