Design of Digital Systems Laboratory

Lab 5

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By submitting this report, you attest that you neither have given nor have received any assistance (including writing, collecting data, plotting figures, tables, or graphs, or using previous student assignments as a reference), and you further acknowledge that giving or receiving such assistance will result in a failing grade for this course.

Your Signature: Jonathan Mazurkiewicz

Simulation Results

```
#     set_property needs_save false [current_wave_config]
#   } else {
#     send_msg_id Add_Wave-1 WARNING "No top level signals found. Simulator will start without a wa
#   }
# }
# run 1000ns
Note: Simulation passed!
Time: 928 ns  Iteration: 0  Process: /vending_machine_subsystem_tb/tb  File: C:/Users/jonma/OneDrive
INFO: [USF-XSim-96] XSim completed. Design snapshot 'vending_machine_subsystem_tb_behav' loaded.
INFO: [USF-XSim-97] XSim simulation ran for 1000ns
```

This lab implements a vending machine. 4 switches determine which soda to buy, the 7 seg display holds the soda price to the left and the deposit amount to the right, 4 buttons are responsible for pushing each coin to the deposit amount, and the center switch attempts to purchase the soda. LEDs are used to verify status.

Area Implementation

Name	Constraints	Status	WNS	TNS	WHS	THS	WBSS	TPWS	Total Power	Failed Routes	Methodology	RQA Score	QoR Suggestions	LUT	FF	BRAM	URAM	DSP	Start	Elapsed
✓ synth_1	constrs_1	synth_design Complete!												154	314	0	0	0	4/12/23, 1:14 AM	00:00:38
✓ impl_1	constrs_1	route_design Complete!	5.190	0.000	0.040	0.000		0.000	0.111	0	30 Warn			153	318	0	0	0	4/12/23, 1:38 AM	00:01:06

Timing Implementation

Setup

Worst Negative Slack (WNS):	5.190 ns
Total Negative Slack (TNS):	0.000 ns
Number of Failing Endpoints:	0
Total Number of Endpoints:	456

Hold

Worst Hold Slack (WHS):	0.040 ns
Total Hold Slack (THS):	0.000 ns
Number of Failing Endpoints:	0
Total Number of Endpoints:	456

Pulse Width

Worst Pulse Width Slack (WPWS):	4.020 ns
Total Pulse Width Negative Slack (TPWS):	0.000 ns
Number of Failing Endpoints:	0
Total Number of Endpoints:	323

All user specified timing constraints are met.

Video Explanation

https://youtu.be/7ZNWyTyaLls