

Lab 4

High-Level Verilog

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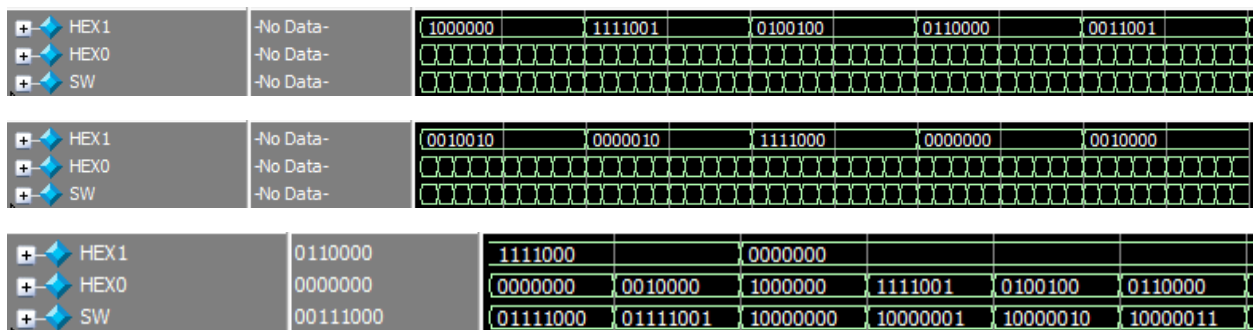
Your completed Table 1, showing your new items, their UPC codes, and classifications.

Item Name	UPC	Discounted	Expensive	Display
Potato Crown	0 0 0	No	Yes	PotAtO
Pig's Foot	0 0 1	No	No	FOOt
Rocket Launcher	0 1 1	Yes	No	-- [≡≡] --
Pigman Sword	1 0 0	No	Yes	BLOOd
Steering Wheel	1 0 1	Yes	Yes	StEEr
Anarchy Technoblade Youtooz Figure (Drops April 29 th for only \$29.99 with worldwide shipping!!!!)	1 1 0	Yes	No	tECH[]O

Table 1. New list of products being sold, including UPCs, classifications, and HEX display patterns.









A screenshot of the ModelSim simulations you will demonstrate during the demo.









Double 7-Segment Display Simulation



The top two simulation screenshots show that for each of the 100 possible two-digit decimal integers, a valid output is given to the HEX displays. The bottom screenshot shows a small region shows that the correct display is given for each of the two-digit numbers. For example, notice that for $SW=01111000$ (78), the correct light pattern for the two HEX displays is correct.

Fred Circuit Simulation

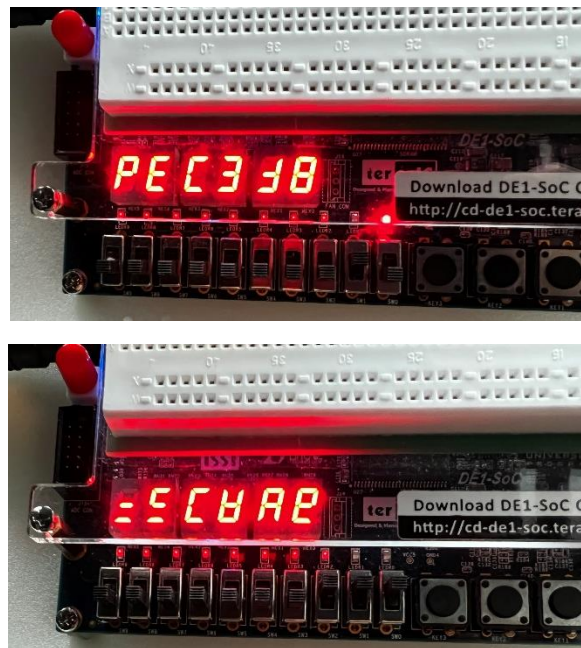
+  HEX5	-No Data-	0001100		1111111				0111111	
+  HEX4	-No Data-	1000000		1111111				0111111	
+  HEX3	-No Data-	0000111		0001110				1000110	
+  HEX2	-No Data-	0001000		1000000				0110110	
+  HEX1	-No Data-	0000111		1000000				0110110	
+  HEX0	-No Data-	1000000		0000111				0001111	
+  stolen/discounted	-No Data-	10	00			01			
+  M/UPC	-No Data-	0000	1000	0001	1001	0010	1010	0011	1011

+  HEX5	-No Data-	1111111				0000111			
+  HEX4	-No Data-	0000000		0010010		0000110			
+  HEX3	-No Data-	1000111		0000111		1000110			
+  HEX2	-No Data-	1000000		0000110		0001001			
+  HEX1	-No Data-	1000000		0000110		1001000			
+  HEX0	-No Data-	0100001		1001100		1000000			
+  stolen/discounted	-No Data-	10	00	11	01			00	
+  M/UPC	-No Data-	0100	1100	0101	1101	0110	1110	0111	1111

These screenshots show the output for the Fred circuit, combining the UPC description module and the Lab 3 Nordstrom circuit. Notice the HEX display patterns match what is given in *Table 1* for each item.

Also notice the displays show “Don’t Care” outputs for unused UPCs.

Drawings of the 7-seg display output for each of the unused UPC codes.



Pictures of the HEX displays for unused UPCs. The above screenshot shows the display for UPC 010. The bottom screenshot shows the display for UPC 111.

Time Estimation

This lab took approximately 4 hours, in total, to complete.