Question: What is the purpose of the anode signals (AN3 to AN0)?

* In order to light up any of the segments of a digit, its corresponding anode signal must be asserted (i.e., provide current for individual light-emitting diode (LED) segments of the digit).

Question: What is the purpose of the segment cathode signals (CA, CB, CC, CD, CE, CF, CG, and DP)?

* The eight cathode signals correspond to individual light emitting diode (LED) segments within a digit.

Question: Are the anode control signals low asserted or high asserted?

* Low

Question: Are the segment cathode signals low asserted or high asserted?

* Low

Question: The seven-segment display interface has 12 input pins: 7 segment pins, 1 DP pin, and 4 anode pins. Why does the display manufacturer time-multiplex the display, instead of providing segment and DP pins for each digit?

* This sharing of cathode signals between all of the digits is a way to reduce the pin count of the four-digit seven-segment display.

Question: How many pins would an 8-digit display require if you have unique segment pins and DP pins for each digit?

* 8\*8 = 64 inputs

Question: How many pins would an 8-digit display require if you have seven segment pins and one DP pin shared among all 8-digits?

* 8+8 = 16 inputs

Question: What would happen if all four anode control signals were asserted simultaneously?

* All four displays will show the same segments turned on.

Question: If the voltage drop between the collector and emitter of the BJT is 0.7V and the forward bias voltage of the LED used by the segment is 1.7V, how much current will ﬂow through the segment LED when it is turned on?

* (3.3-.7-1.7)/100 = .9/100 = 9mA

Question: Which concurrent statement is most appropriate for this decoding function? (i.e., a simple signal assignment statement, a conditional signal assignment statement, or a selected signal assignment statement)

* Selected signal assignment statement was proper because there were many branches without any priority.

Question: What time does the simulation end (i.e., when is the Simulation Done message printed)?

* 42000ns

Question: Review the synthesis report and determine the number of “slices” of your design.

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Personal Exploration

* I found some good uses of sequential statements by using process(). I thought by using both concurrent and sequential the behavior of the circuit is more easily defined. As I understood more of the schematics of the circuit, I became more confident that I could play around with switches, segments and buttons and so on.