

ELEX 7660: Lab 1

7-Segment LED Decoder

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# Modules

## Decode2

// decode2.sv - ELEX 7660 – 2 to 4 decoder. Selects which digit of the 7-segment LED Display to enable.

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**module** decode2 **(** **input** **logic** **[**1**:**0**]** digit**,**

**output** **logic** **[**3**:**0**]** ct**);**

**always\_comb**

**case(**digit**)**

0 **:** ct **=** 4'b0001**;**

1 **:** ct **=** 4'b0010**;**

2 **:** ct **=** 4'b0100**;**

3 **:** ct **=** 4'b1000**;**

**endcase**

**endmodule**

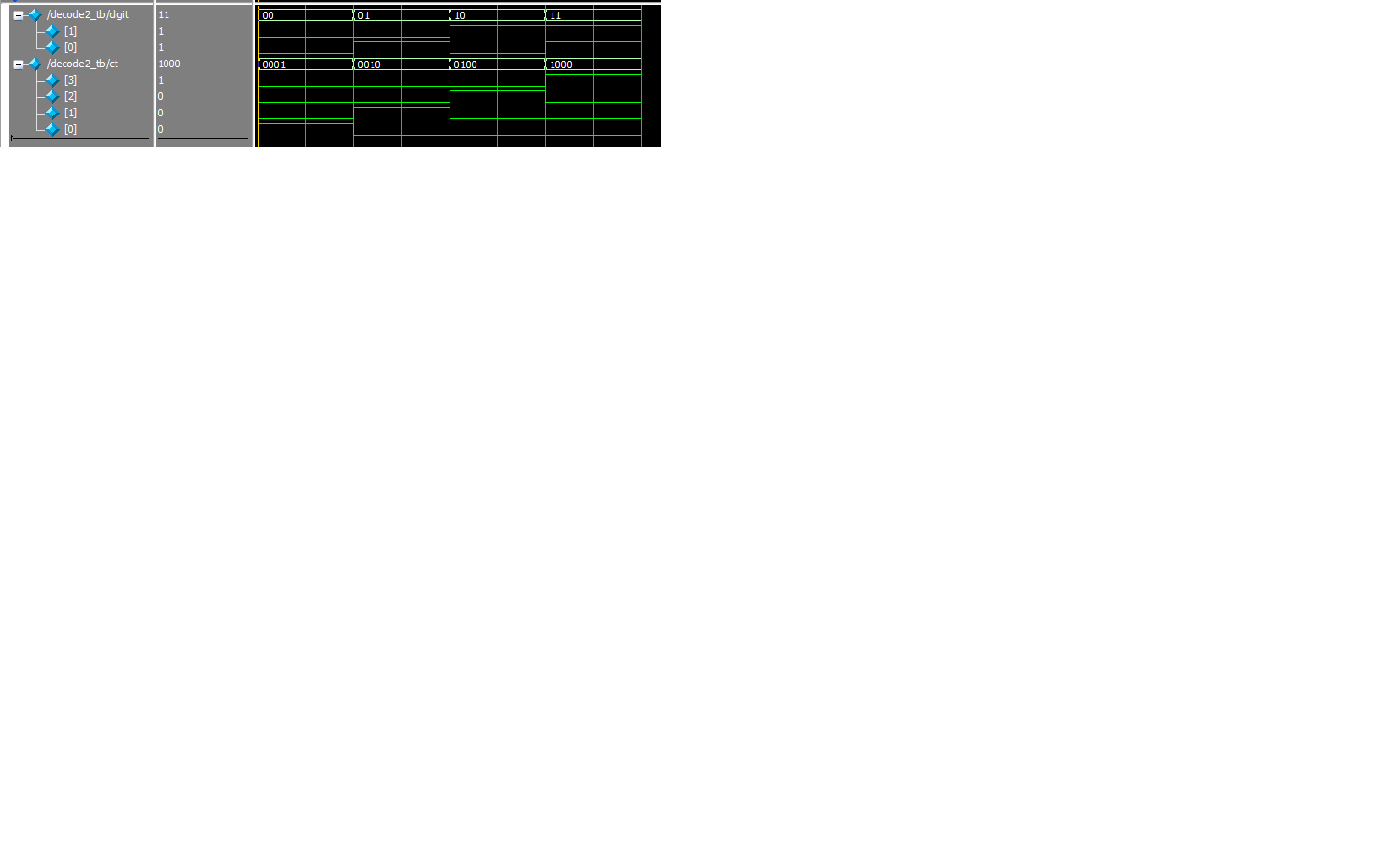


Figure 1: Decode2 Waveform

## Bcitid

// bcitid.sv - ELEX 7660 - Module that selects and stores the last 4 digits of my student ID

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**module** bcitid **(** **input** **logic** **[**1**:**0**]** digit**,**

**output** **logic** **[**3**:**0**]** idnum**);**

**always\_comb**

**case(**digit**)**

3 **:** idnum **=** 0**;**

2 **:** idnum **=** 4**;**

1 **:** idnum **=** 3**;**

0 **:** idnum **=** 9**;**

**endcase**

**endmodule**

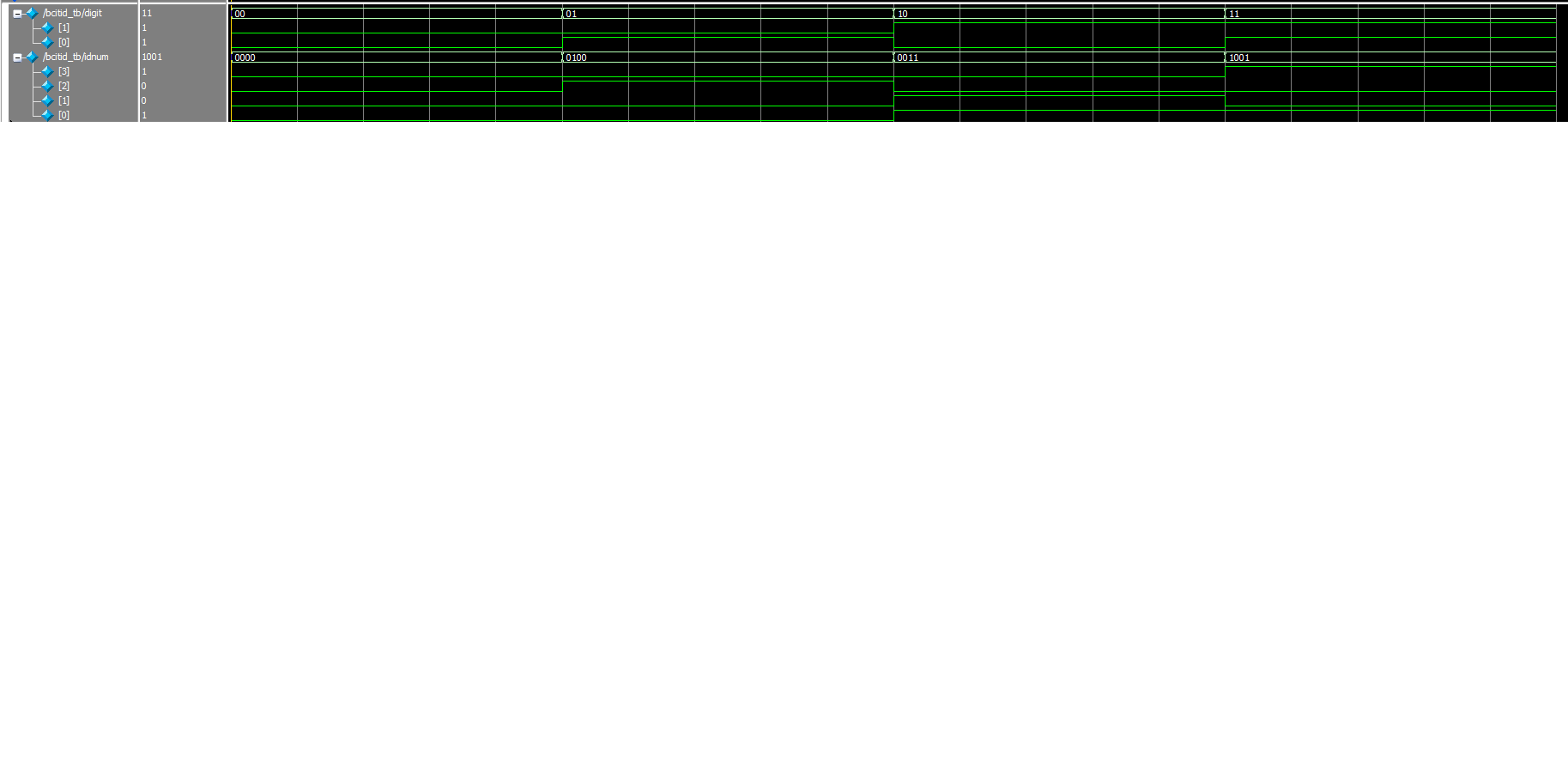


Figure 2: Bcitid Waveform

## Decode7

// decode7.sv - ELEX 7660 – Converts ‘num’, a decimal integer 0 – 9 (10 for DP), into an 8-bit vector ‘leds’ that will light up corresponding segments on a 7-segment LED.

// Nicholas Huttemann 2018-01-12

**module** decode7 **(** **input** **logic** **[**3**:**0**]** num**,**

**output** **logic** **[**7**:**0**]** leds**);**

**always\_comb**

**case(**num**)**

0 **:** leds **=** 8'b11000000**;**

1 **:** leds **=** 8'b11111001**;**

2 **:** leds **=** 8'b10100100**;**

3 **:** leds **=** 8'b10110000**;**

4 **:** leds **=** 8'b10011001**;**

5 **:** leds **=** 8'b10010010**;**

6 **:** leds **=** 8'b10000010**;**

7 **:** leds **=** 8'b11111000**;**

8 **:** leds **=** 8'b10000000**;**

9 **:** leds **=** 8'b10010000**;** //Updated to new style of 9

10**:** leds **=** 8'b01111111**;**

**endcase**

**endmodule**

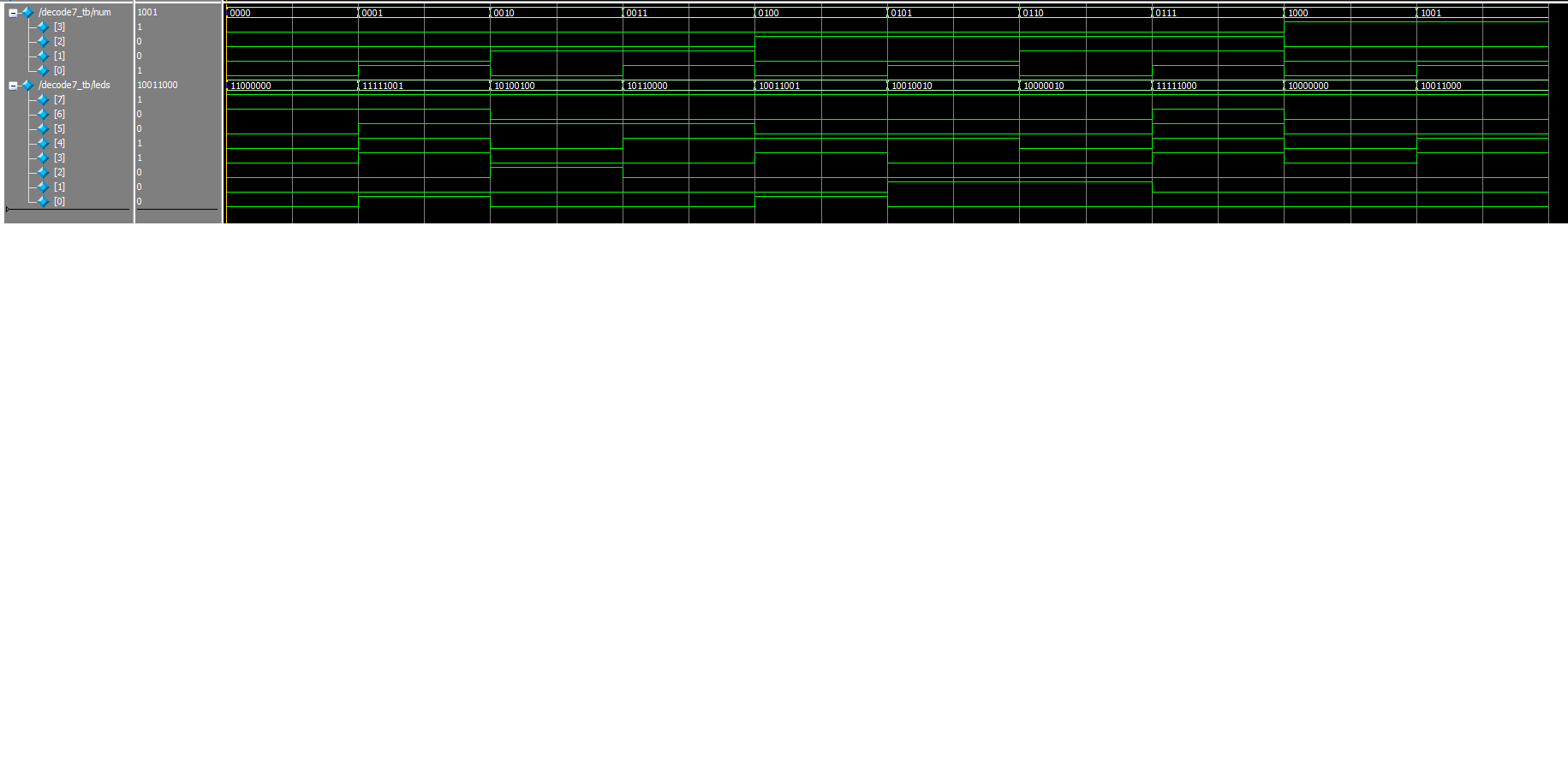


Figure 3: Decode7 Waveform

## Schematic

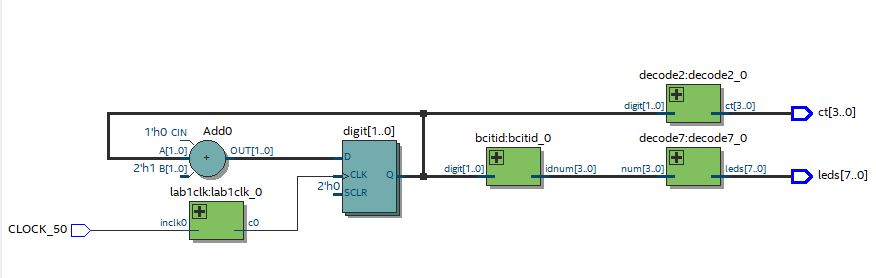


Figure 4: Circuit schematic created by Quartus

## Compilation Report

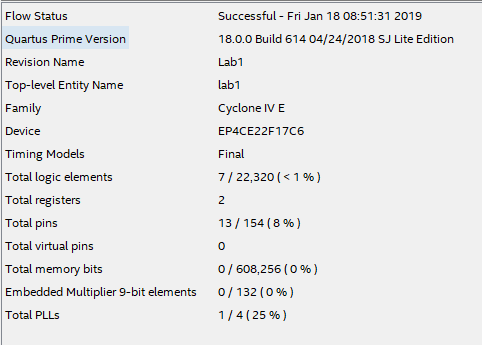


Figure 5: Compilation Report