

Solutions PDF Generated from: solutions-openai-generated/labs/lab-03-solutions-set- 02.json

Question A

Fill in the truth table that converts a binary number to a 7-segment encoding. Note that a segment should glow when the corresponding output is logic-0.

Binary Input	A	B	C	D	E	F	G
0000	0	0	0	0	0	0	1
0001	1	0	0	1	1	1	1
0010	0	0	1	0	0	1	0
0011	0	0	1	1	1	1	0
0100	0	1	0	0	1	0	0
0101	0	1	0	1	1	0	0
0110	0	1	1	0	1	0	0
0111	0	1	1	1	1	0	0
1000	1	0	0	0	0	1	0
1001	1	0	0	1	0	1	0
1010	1	0	1	0	0	1	0
1011	1	0	1	1	0	1	0
1100	1	1	0	0	0	1	0
1101	1	1	0	1	0	1	0
1110	1	1	1	0	0	1	0
1111	1	1	1	1	0	1	0

Question B

Write Verilog code for 7-segment decoder.

```
/* Verilog code for 7-segment decoder */

wire [6:0] seg; // 7-segment display output

module seg_decode(input [3:0] a, output [6:0] seg);

// declare a 4-variable array with all components being wire
wire [3:0] array[3:0];

// assign input signals to each element of the array
assign array[3] = a[3];
assign array[2] = a[2];
assign array[1] = a[1];
assign array[0] = a[0];

if (array == 4'b0000) begin
```

```

        seg = 7'b1000000; // Display 0
    end

    else if (array == 4'b0001) begin
        seg = 7'b1111001; // Display 1
    end

    else if (array == 4'b0010) begin
        seg = 7'b0100100; // Display 2
    end

    else if (array == 4'b0011) begin
        seg = 7'b0110000; // Display 3
    end

    else if (array == 4'b0100) begin
        seg = 7'b0011001; // Display 4
    end

    else if (array == 4'b0101) begin
        seg = 7'b0010010; // Display 5
    end

    else if (array == 4'b0110) begin
        seg = 7'b0000010; // Display 6
    end

    else if (array == 4'b0111) begin
        seg = 7'b1111000; // Display 7
    end

    else if (array == 4'b1000) begin
        seg = 7'b0000000; // Display 8
    end

    else if (array == 4'b1001) begin
        seg = 7'b0010000; // Display 9
    end

endmodule

```

Execution Time

0:00:27.874435

OpenAI Parameters

Model: text-davinci-003, Max. Tokens: 1024, Temperature: 1, N: 1