Problem Sheet 3 – For tutorial class on 9/02/2021

1. A Mealy sequential circuit has one input X and one output Z. The output goes to 1 when the input sequence 011 has occurred and the output goes to 0 if the input sequence 110 occurs. At all other times, the output holds its value. Derive a Mealy state graph and table for the circuit. Example: X = 0 1 1 0 0 1 0 1 1 0 0 1 1 1 0 1 1 0 0 1

   Z = 0 0 1 0 0 0 0 0 1 0 0 0 1 1 0 0 1 0 0 0 0

2. A Mealy sequential circuit has one input X and one output Z. The output goes to 1 when the input sequence 110 has occurred and the output goes to 0 if the input sequence 011 occurs. At all other times, the output holds its value. Derive a Mealy state graph and table for the circuit.

   Example: X = 0 1 1 0 0 1 0 1 1 0 0 1 1 1 0 1 1 0 0 1

   Z = 0 0 0 1 1 1 1 1 0 0 0 0 0 0 1 1 0 1 1 1 1

3. A Mealy sequential circuit has one input X and one output Z. The output goes to 1 when the input sequence 010 has occurred and the output goes to 0 if the input sequence 011 occurs. At all other times, the output holds its value. Derive a Mealy state graph and table for the circuit.

   Example: X = 0 1 1 0 0 1 0 1 1 0 0 1 1 1 0 1 1 0 0 1 0

   Z = 0 0 0 0 0 0 1 1 0 0 0 0 0 0 0 0 0 0 0 0 1

4. A Mealy sequential circuit has one input X and one output Z. The output goes to 1 when the input sequence 110 has occurred and the output goes to 0 if the input sequence 111 occurs. At all other times, the output holds its value. Derive a Mealy state graph and table for the circuit.

   Example: X = 0 1 1 0 0 1 0 1 1 0 0 1 1 1 0 1 1 0 0 1 0

   Z = 0 0 0 1 1 1 1 1 1 1 1 1 1 0 1 1 1 1 1 1 1

5. A Mealy sequential circuit has one input X and one output Z. The output goes to 1 when the input sequence 000 has occurred and the output goes to 0 if the input sequence 001 occurs. At all other times, the output holds its value. Derive a Mealy state graph and table for the circuit.

   Example: X = 0 1 0 0 0 0 0 1 1 0 0 0 1 1 0 1 1 0 0 0 1

   Z = 0 0 0 0 1 1 1 0 0 0 0 1 0 0 0 0 0 0 0 0 1 0

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