Task 2

In this section, the objetive is to recognize a sequence of 4 bits that come in a synchronized way. If the sequence is recognized, an output is turned on. Using a Moore's state machine, the resulting diagram is as shown below.

Notice that when the sequence is recognized, the machine needs to be reseted to detect a new combination. With the diagram, the following transition table is made.

Using Karnaugh's maps, the functions for the diferent states and the output are made as follows.

With the functions, the state machine is implemented using 3 D Flip Flops as shown below.

Now, the same system is implemented using a Mealy's state machine, wich resulting diagram is shown below.

Using the diagram, a table with the state transitions is made.

Using Karnaugh's maps, the functions for the states and the output are made below.

With the defined functions, the state machine is implemented with 2 D Flip Flops. In this case is used one less flip flop, and the machine can used again without reset it.