Electronic Design Automation
CSE 215

Course Project

Courtesy of F. Wajsbürt & J.-P. Chaput – University of Paris VI

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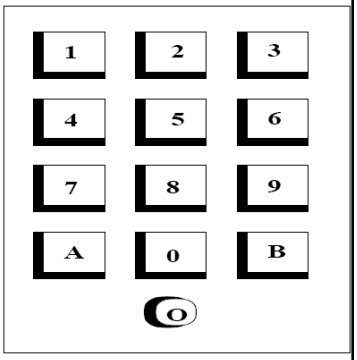
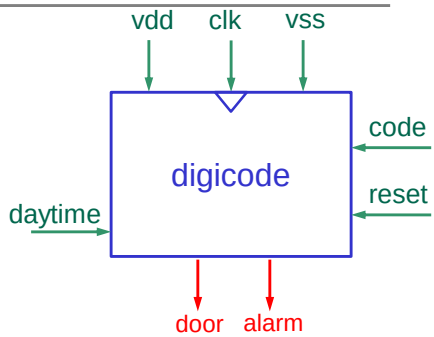
Digital Access Control

- The correct code is **26A05.**
- Operates in two modes:
  - Daytime: in the morning, door opens when
    - pressing “O”,
    - entering the complete correct code
    - pressing “O” in the middle between any digit of the correct code.
  - Night: opens only if the code is correct.
- An alarm is triggered in case of
  - An incorrect entry, as soon as a wrong number is pressed.
  - If “O” is pressed at night at any instance, even after any number of the correct code before it is complete.
- Numbers from 0 to 9 are binary coded, A=1010, B=1011 and O=1101.



Inputs and Outputs

- Applied externally == applied in the testbench.
- **code:** input code, *applied externally*, one number at a time, binary coded.
- **daytime:** =1 *applied externally* during the morning.
- **door:** =1 when correct code.
- **alarm**: =1, see previous slide.
- **reset:** =1 *applied externally* after:
  - Door opens (door=1).
  - **alarm** is triggered (alarm=1)



Can be applied at any instance, *i.e.* after any digit is pressed.

Action: deletes entered code and restarts from the beginning waiting for the first digit. Both door and alarm are set to 0.

Should be a Synchronous reset as Alliance does not support Asynchronous.

Project Implementation

- Project statement, deliverables and deadline, see course web site.
- Guideline files throughout the lectures. Check the "Course Project Files" folder.

First Step – Project 1: Deadline 16/4/2019

- Design the state diagram. Choose Mealy or Moore outputs. Must explicitly state your choice in the documentation.
- Implement the FSM in VHDL.
- Prepare a ModelSim testbench to validate your design with proper assertions to be used throughout the project.
  - The more the assertions, the more effective the testbench will be in testing different phases of the design.

- Best to do each part of the project after the lecture directly and be prepared for the next step.