

Systems Design Laboratory 2022/2023  
Discrete Event Systems Module on Supervisory Control  
Pyrolytic Oven

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Assignment	Max Grade	Achieved Grade
A1	2	
A2	2	
A3	1	
Final grade	5	

## Plant description

We want to realize a pyrolytic oven (self-cleaning oven) by means of the following modules.

1. A program selector that allows to select a program among *cooking* and *pyrolysis*. Such a module imposes that no program is selected in its initial state. Once a program has been selected, such a module only allows to deselect it.
2. A start/stop button to start or stop the oven. In its initial state the oven is OFF, whereas once started (the oven is ON) such a module only allows to stop the oven.
3. A door that can be either open or closed. In its initial state the door is closed and thus it can only be opened. Conversely, once the door is open it can only be closed.

## Assignments

- A1) Define a finite state automaton for each component above.
- A2) Define a finite state automaton for each of these requirements.
- $R_1$ ) The oven can be started only if a program has been selected.
  - $R_2$ ) A selected program can be deselected only if the oven is off.
  - $R_3$ ) If pyrolysis has been selected, then the oven can be started only if the door is closed.
  - $R_4$ ) If pyrolysis has been selected and the oven has been started, then the door cannot be opened until when the oven is switched off.
- A3) Implement this exercise with ESCET. Specify the plant and the requirements with CIF. Use ToolDef to synthesize the supervisor enforcing  $R_1, R_2, R_3$  and  $R_4$  and deploy your supervisor. Check that the behavior of the controlled plant is the expected one.