

# Assignment 2

(10 Points)

To be solved in the weeks starting on Monday, May 19, 2014

This assignment is to be solved in sessions on May, 21st and 28th.

**Hint:** It's a good idea to verify your design in the simulator prior to flashing the boards.

## 2.1 Wrap-Around Counter (4 Points)

Create a “wrap-around” counter that counts from 0 to 9 upwards as well as downwards. If either 9 or 0 is reached, counting further in the given direction shall commence with 0 or 9 respectively. In addition, it must be possible to reset the counter to 0 at any time. Make use of the buttons on the board and use the function `writeLine0(VS_INT number)` to output the current number.

## 2.2 Ventilator Control (6 Points)

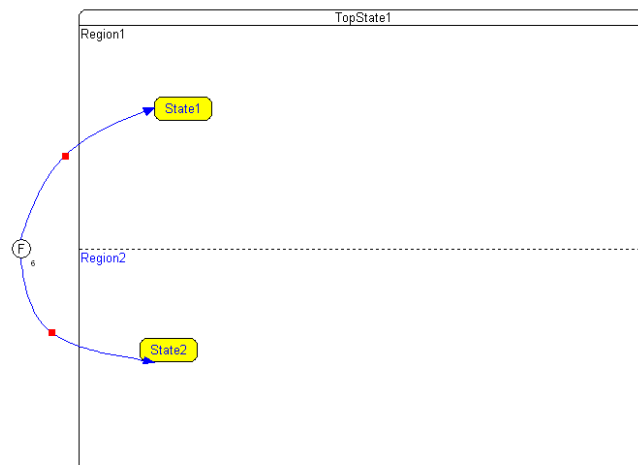
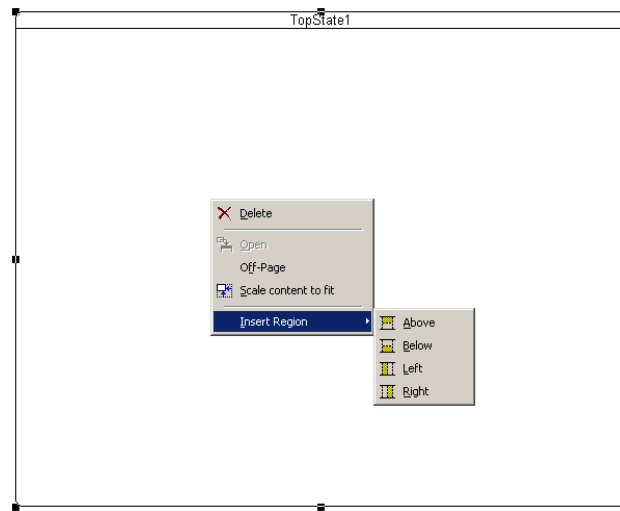
Implement the control software for a table ventilator. The device shall feature three buttons:

- Power on/off
- Speed level
- Head rotation on/off

Three speed levels shall be supported (*slow*, *med*, *fast*). The speed level is a wrap-around logic. The next level beyond “fast” is “slow”. If the device is turned off, the state of the speed level as well as the head rotation shall be preserved and restored once it is turned back on. The device shall be turned off by default (system reset). To print output to the display, use the following functions with the predefined arguments.

- `writeLine0(-1)` prints “Off”
- `writeLine0(0)` prints “Speed: slow”
- `writeLine0(1)` prints “Speed: med”
- `writeLine0(2)` prints “Speed: fast”
- `writeLine1(0)` prints “Moving: yes”
- `writeLine1(1)` prints “Moving: no”

**Hint:** To create an *AND super state*, insert a composite state. Click the state with the right mouse button and select “Insert Region” (see screenshot). In visual State, to activate sub-states in *AND super states* it is not sufficient to draw a direct arc into the sub-states. Instead an explicit *fork node* must be used to “split” control prior to drawing parallel arcs into the sub-states (see screenshot). Leaving the sub-states can be done directly without explicit *join nodes*.



#### General notes:

Dates and additional information can be found on the lecture website (can also be found via EWS). The assignments will be typically be published **Mondays** on a weekly basis and have to be solved in the lab session of the same week. To pass the labs, a minimum of 50% of the total points must be achieved in the first half and the second half, respectively.