

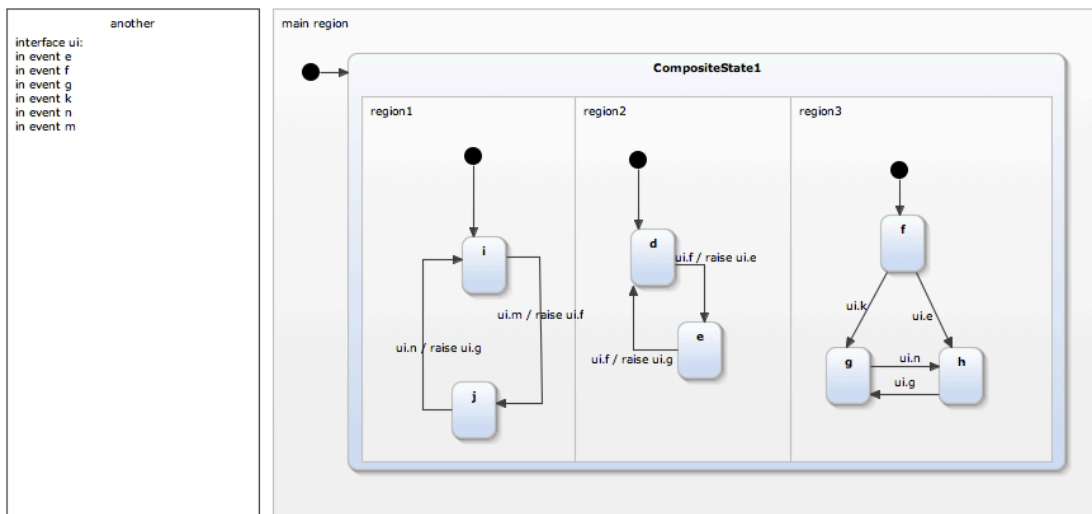
# Statechart Modeling Using Yakindu, part 2

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In this lab session, we will try out some advanced statechart constructs. We assume you have completed the first lab session and, therefore, we will skip all the detailed description of steps.

## Part 1. Orthogonal regions and explicit signal management

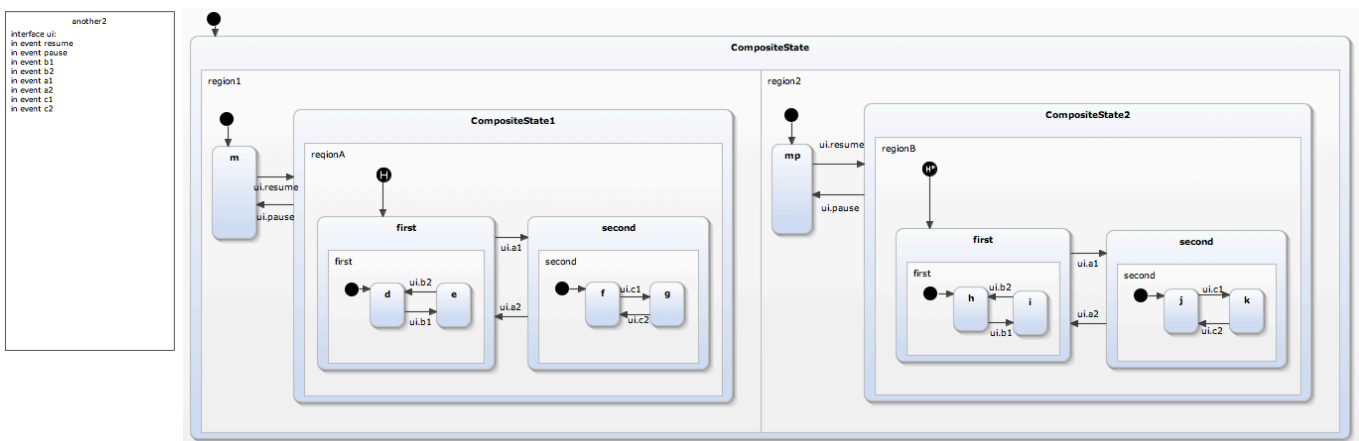
Create the following statechart in Yakindu SCT



You can select the composite states and regions directly from the palette in the right-hand side of the framework. In some transitions, besides the events, we are also specifying other signals to be raised, e.g., `ui.f / raise ui.g`. Simulate the model and enter the following sequence of signals: `m`, `f`, `n`. What is the final global state?

## Part 2. Shallow vs. Deep History

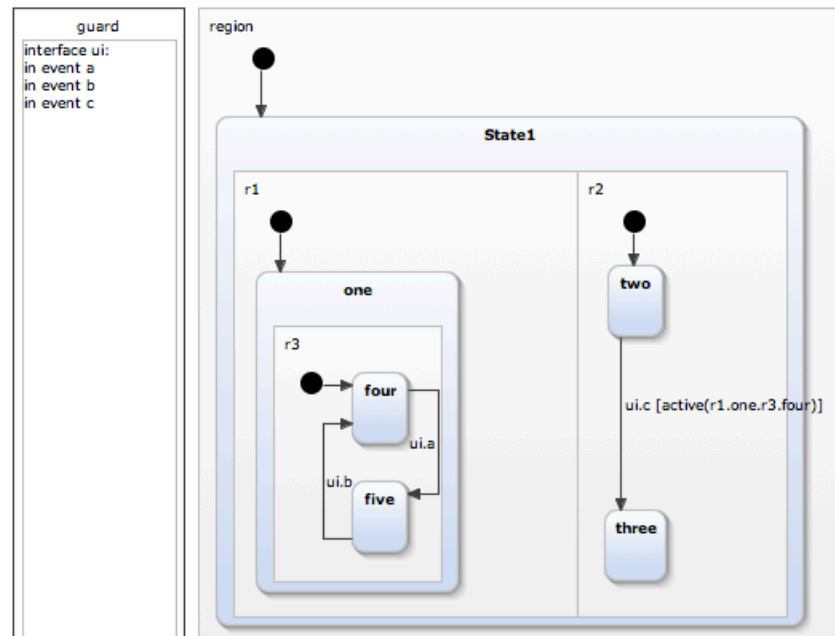
Create the following statechart:



What is the global state after the sequence of events “resume, a1, c1, pause, resume”?

### Part 3. Guards

Create the following statechart:



Note that the guard in the transition from state *two* to *three* specifies that, during the simulation, state *three* can be activated iff transition *c* is executed while state *four* is active. Try the sequences of states “a,c” and, in another run of the simulation, “c,a”.

### Part 4. Smart switch

The goal of this exercise is to model the behaviour of a smart light switch. The light has 6 levels of brightness (from “0”=“switched” off up to “5”=“max brightness”). There is only one button to control it. The behaviour of this smart switch can be expressed like this:

- If the light was “on”, then a single “push and release” on the button, will switch “off” the light,
- If the light was “off”, then a single “push and release” on the button, will switch “on” the light at the previous brightness level,
- One “push and hold” on the button makes the level of brightness increase (resp. decrease) if it was decreasing (resp. increasing) previously,
- Once the maximum (resp. minimum) level of brightness is reached the brightness level decrease (resp. increase).

### Tasks:

1. Create a statechart of this smart switch.

2. Make some simulations.
3. Add the following feature to your model: In case of "double push and release", if the light is on, the brightness goes up to the maximum.

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