SWEN224 2017 Lab Exercises 1 - sequential- processes

Events

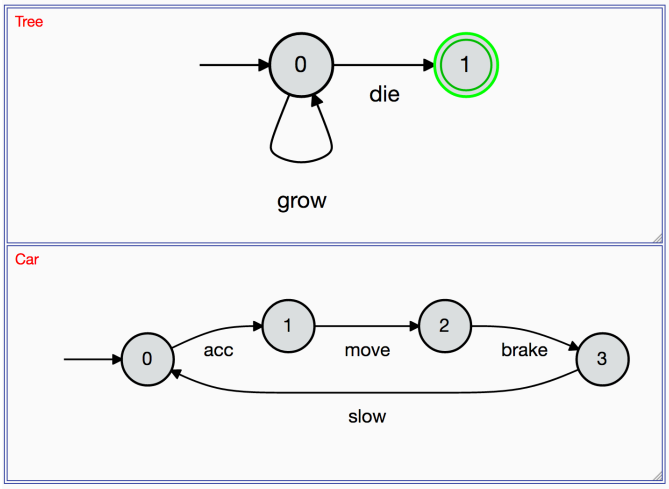
Read about the language defined in README pdf before you start and again when you get stuck. You can find this document under Week 1 of the Lecture Schedule for SWEN224.

The events we use in our process models are atomic: i.e. are not decomposed into parts. Before you can know for sure what is and what is not an event you need to experiment with and understand the language we are going to use to model processes.

In the left hand window you can define processes using the defined language. Processes must appear with in `automama { ... }` and when parsed they will be dispalyed in the right hand window. Typing:

```
automata {
   Car = acc->move->brake -> slow->Car.
   Tree = grow ->Tree | die -> STOP.
}
```

should result in



Activity 1

To start the tool type ? in a terminal.

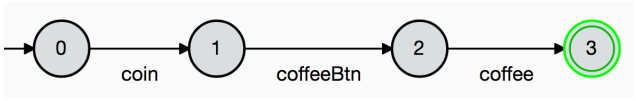
1. This activity is simply to explore the tool to get an initial understanding of how to build models and indexed models.

   (a) Start LTSA tool, select >File>New

   (b) type:

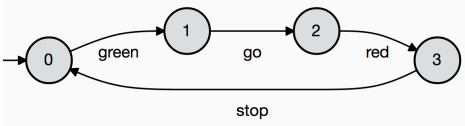
   ```
   automata {
   VendingMachine = (coin -> coffeeBtn -> coffee -> STOP).
   }
   ```

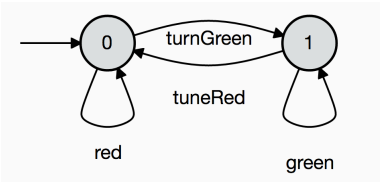
   (c) check the result:



2. ping

3. Define a Car that stops at the red light and only moves when the light is green so that it behaves as in the automata below. Similarly for the traffic light `TLred`.





   One undesirable feature of this model is that the car needs to be at a red light before it can stop. Add the ability for the car to stop even when there is no red light.

Activity 2

分配

1. Model a vending machine that dispenses coffee or tea depending on which of two buttons are pushed teaBtn,coffeeBtn. The buttons only do something if a coin has previously be inserted. Build two of vending machines with different termination properties:

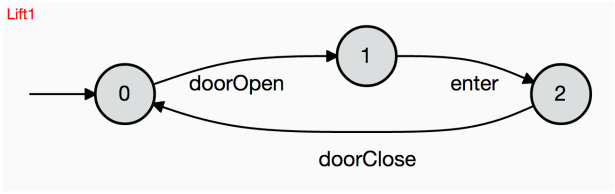
   (a) The first vending machine terminates after dispensing any drink.

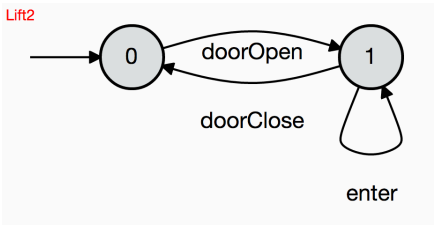
   (b) The second vending machine never terminates.

   (c) Finally model a vending machine that, when the coffee button is pushed coffee is always dispensed but when the tea button is pushed the vending machine sometimes dispenses coffee and some times keeps the money and waits for another coin to be inserted.

Activity 3

1. Specify a the processes Lift1 and Lift1 . Give a one sentence explanation as to which is more realistic Lift1 or Lift2?





2. Make a copy of your preferred **Lift** process, calling it **Lift3** and add to it a button inside the lift. Pushing the button must be modelled by the *goUpBtn* event. Add the ability for the lift to move, modelled by a *move* event.

   Your new **Lift3** process should only move when both the door is closed and the *goUpBtn* event has occurred.

3. In industry specifications are rarely perfect! Worse still you do not get to blame any one for this. It is your job to find the imperfections and sort things out.

   So in the above **Lift3** process it was not specified what should happen if the goUpBtn was pushed when the door is open. I can see two options:

   (a) ignore the button pushing

   (b) record the information and move after the door closes.

   Which solution did you implement? now implement the alternative solution.

Marking Guide

Each lab is worth just over 1% of your overall mark for SWEN224. The lab should either be marked:

1. during the lab sessions
2. or submitted on the week of the lab and before midnight Wednesday

The labs will be marked according to the following grade scale:

- **0**: Student didn't attend lab or submit anything.
- **E**: Student did not really participate in the lab and submitted work was unintelligible.
- **D**: Student's participation was *poor*. Attempted the work, but did not complete any activities.
- **C**: Student's participation was *satisfactory*. That is, he/she completed activities 1.
- **B**: Student's participation was *good*. That is, he/she completed activities 1 and 2
- **A**: Student's participation was *excellent*. That is, he/she completed activities 1,2 and 3.