TDT4171 - Exercise 2

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1 Part A

- The set of unobserved variables is one state variable $Rain_t$, denoting whether or not it is raining at time-slice t
- The set of observable variables is one evidence variable $Umbrella_t$, indicating whether or not the director arrives with an umbrella at time-slice t.
- Transition model:

		$Rain_t$	
		t	f
$Rain_{t-1}$	t	0.7	0.3
	f	0.3	0.7

  Observation model:

		$Umbrella_t$	
		t	f
$Rain_t$	t	0.9	0.1
	f	0.2	0.8

- The model has the following assumptions:
  - Markov assumption: state at current time-step only depends on state at previous time-step
  - Stationary process: the transition model does not change
  - Sensor Markov assumption: the sensor data only depends on the current state

  In the umbrella world, these are fairly reasonable assumptions. Weather effects usually stay constant over any foreseeable time period, and whether or not you bring an umbrella is mostly decided by what the weather is like today. The Markov assumption is however a bit simplifying. Weather changes are not dependent on the past weather, but rather complex systems involving lots of factors (e.g. pressure).