

Assignment 3

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📁 Class	TDT4171
📁 Type	Assignment
📎 Materials	
☑ Reviewed	<input type="checkbox"/>

Exercise 1 - Describing the umbrella world

- The set of unobserved variable(s) for a given time-slice t is whether or not it is raining at that time
- The set of observed variables(s) for a given time-slice t is whether or an umbrella is observed
- Dynamic model for $P(X_t|X_{t-1})$: $\begin{bmatrix} 0.7 & 0.3 \\ 0.3 & 0.7 \end{bmatrix}$
- Observation model $P(E_t|X_t)$: $\begin{bmatrix} 0.9 & 0.2 \\ 0.1 & 0.8 \end{bmatrix}$
- The assumptions for this model is that the probability of a person having an umbrella is only dependent on the wheather the same day, but in real life this might be dependent on other things. Also, one only calculates the probability of it raining one day only based on the wheather the previous day. In this case, other factors could also come into play. However, these other factors, in both assumptions, would in the general case not affect the outcome that much, since the reasons that are taken into account is the main factor of the outcome.

Exercise 2 - Filtering using the *Forward* operation by programming

- Implementation in e2.py

Task 2.1:

```
[[0.88335704 0.88335704]  
 [0.11664296 0.11664296]]
```

Task 2.2:

```
[[0.86733889 0.86733889]  
 [0.13266111 0.13266111]]
```