

## Assignment 2: Probabilistic Graphical Models

Machine Learning

Fall 2019

### 🔗 Learning Objectives

- TODO

#### 1 Motivation and Context

- We've learned how probabilities can be used to describe uncertainty in the world
- We've learned how Bayes rule can be used to reason about hypotheses, models, or other things that cannot be directly observed.

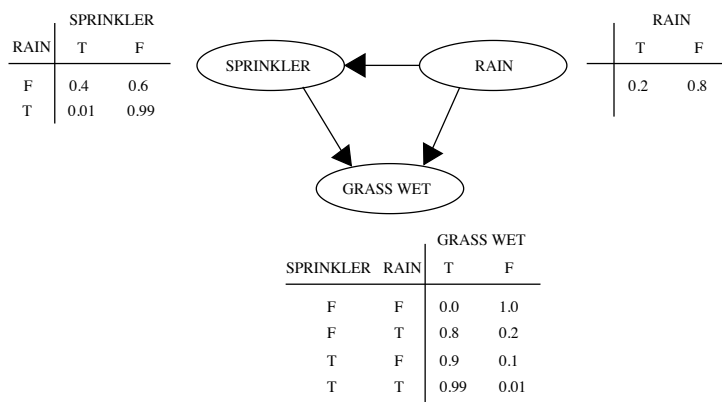
#### 2 Generative versus Discriminative Models

We should make more concrete the distinction between these two things.  $p(y|x)$  versus  $p(x|y)p(y)$

#### 3 Conditional Independence of Random Variables

#### 4 Bayesian Networks

##### 4.1 Simple Example



- Link to external resources
- D-separation

### 🔗 External Resource(s)

Read [d-Separation without Tears](#).

- State the main conditions
- Do some exercises to determine when things are conditionally independent

### Exercise 1

The alarm problem (need to find this one from CSE250A) ([This has the description of the same network](#)). [More detail on the same network](#).

5 *Naïve Bayes*

6 *Probabilistic frameworks for Fairness in ML*

7 *Compas Model of Recidivism*

