

# Intro to Artificial Intelligence

## Assignment 6

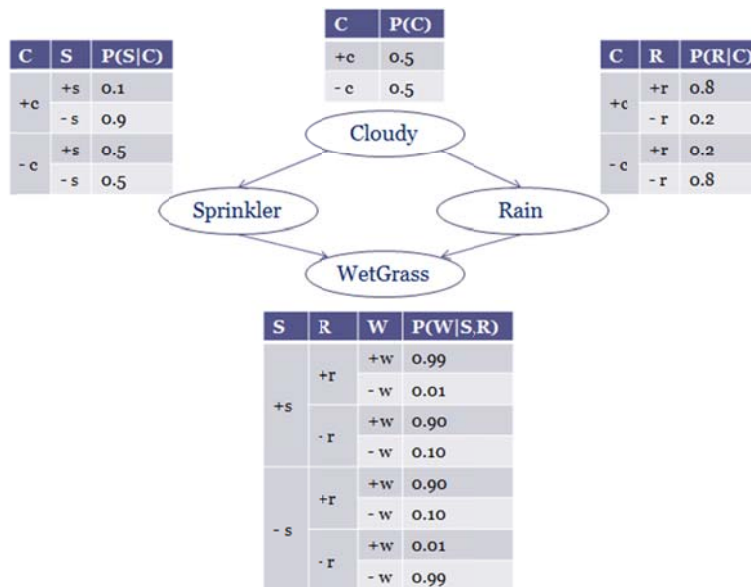
**Due: you don't have to submit this assignment**

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1. True or False:

- a. Gibbs sampling takes all the evidence into account not just the upstream evidence.
- b. Enumeration technique is not suitable for complex problems with many states.
- c. Approximate inference give better accuracy with a few number of samples.
- d. Supervised learning is used for clustering.
- e. Unsupervised learning is used for classification.

2. Consider the Bayes network below, where each table represent the conditional table for the shown variables.



a. Using the Rejection sampling technique complete the following samples.

- I. +C, -----, -----, -----
- II. -C, +S, -----, -----
- III. -C, -S, -----, -----
- IV. +C, -----, +r, -----

b. Using the likelihood weighting sampling technique, recomputed the samples in question a.

c. What the disadvantage of likelihood weighting sampling technique? Suggest another technique to avoid this disadvantage.

3. Lisa has lost gender information of one of her customers, and does not know whether to make a skirt or trousers. Can you help her to make a better decision using a KNN-classifier?

The customer who is missing gender information:

**Gender** ---?---, **Waist** 28, **Hip** 34, Let us use K = 2 nearest neighbors.

Fill in the table to calculate KNN the Euclidean distance .

Gender	waist (cm)	hip (cm)	distance
Male	28	32	$(28-28)^2+(34-32)^2=4$
Male	33	35	$(28-33)^2+(34-35)^2=26$
Female	27	33	
Female	31	36	

Count of the male neighborhood members: \_\_\_\_\_

Count of female neighborhood members: \_\_\_\_\_

The probably Gender is : \_\_\_\_\_