Naive Bayesian Learning

1) A theme park hired you after graduation. Assume that you want to predict when the theme park receives lots of visitors. You gathered the following data:

	Feature 1 Sunny?	Feature 2 High Temperature?	Feature 3 Weekend?	Class Lots of Visitors?
Day 1	yes	yes	yes	yes
Day 2	yes	no	yes	yes
Day 3	no	yes	no	yes
Day 4	yes	yes	no	yes
Day 5	yes	yes	no	yes
Day 6	yes	no	no	no
Day 7	no data since you were on business travel			
Day 8	no	no	yes	no

a) Show the Bayesian network (= hypothesis = model) that a naive Bayesian learner will learn from the data.

b) What's the probability that the learned Bayesian network will predict that the theme park receives lots of visitors on a cloudy and hot weekend day?

2) Construct an example where a naive Bayesian learner predicts for a feature vector that the predicted class must be true with probability 1 when, in reality, it is false.

3) Give an example of a hypothesis (= model, here: joint probability distribution) that a naive Bayesian learner cannot learn correctly.

4) Give an example where the assumptions that a naive Bayesian learner makes are wrong.