

CS 559, Quiz 1

NAME:

Problem 1. (True or False)

- For a 1D Gaussian distribution, a small variance leads to a more flat bell shape.
- For a 1D Gaussian distribution, a small mean leads to a more flat bell shape.
- Rotation is a linear operator.
- Making decision using posteriors can be treated as a special case of that using losses or risks.
- Let λ_{ij} denote the loss incurred for taking action α_i when the true state is w_j . We always have $\lambda_{ij} = \lambda_{ji}$. (2 points)

Problem 2. A doctor gives a patient a (D)rug (drug or no drug) dependent on their (A)ge (old or young) and (G)ender (male or female). Whether or not the patient (R)ecovers (recovers or doesn't recover) depends on all D, A and G.

- (a) Draw the belief network for the above case.
- (b) Is it a Directed Acyclic Graph? Why?
- (c) Decompose the joint distribution $P(A, G, D, R)$ into four terms, each of which is a probability of conditional probability of only one variable.