

# Machine Intelligence

## Assignment 1

(Chapters Questions)

### Team 1

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## Chapter (13)

- 1) Using a full joint probability distribution table is an efficient and scalable way to calculate posteriors. (False)
  - 2) [d] Bayes Rule can help doctors calculating  $P(\text{corona} \mid \text{high\_body\_temp} \wedge \text{dry\_cough})$  because .....
    - a) calculating Diagnosis probability using Causal probability is reasonable.
    - b) calculating Causal probability using Diagnosis probability is reasonable.
    - c) conditional independence makes calculations faster and more scalable.
    - d) a and c.
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## Chapter (14)

- 1) A Bayesian Network's graph can have directed cycles. (False)
  - 2) [c] ..... is the probability distribution that is represented by a Bayesian Network that has a set of  $\{x_1, x_2, x_3, x_4\}$  nodes.
    - a)  $p(x_1, x_2, x_3, x_4) = p(x_1)p(x_2)p(x_3)p(x_4)$
    - b)  $p(x_1, x_2, x_3, x_4) = p(x_1) + p(x_2) + p(x_3) + p(x_4)$
    - c)  $p(x_1, x_2, x_3, x_4) = p(x_1|\text{parents}(x_1))p(x_2|\text{parents}(x_2))p(x_3|\text{parents}(x_3))p(x_4|\text{parents}(x_4))$
    - d)  $p(x_1, x_2, x_3, x_4) = p(x_1)p(x_2|\text{parents}(x_2))p(x_3|\text{parents}(x_3))p(x_4|\text{parents}(x_4))$
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## Chapter (15)

- 1) Extended Kalman Filter (EKF) is an addition over regular Kalman Filter (KF) to overcome nonlinearities in the system being modeled. (True)
- 2) [b] ..... is the task of computing the belief state (the posterior distribution over the most recent state) given all evidence to date.
  - a) Learning.
  - b) Filtering.
  - c) Smoothing.
  - d) Prediction

## **Chapter (21)**

- 1) The main difference between passive reinforcement learning and policy evaluation is that the passive learning agent doesn't know the transition model nor the reward function. (True)
- 2) [c] The task of reinforcement learning is to use ..... rewards to learn an optimal (or nearly optimal) policy from the environment.
  - a) scattered.
  - b) potential.
  - c) observed.
  - d) predicted.