Question Bank- AIML (18CS71)

Module 4

- Explain the concept of Bayes theorem with an example.
- What is Bayesian Learning ? list its features and mention practical difficulty in applying Bayesian methods.
- Explain Bayesian belief network ,conditional independence with example. Also mention its usage.
- Explain Brute force MAP hypothesis learner.
- Explain 1) k-Means Algorithm and its derivation. 2) K-means algorithm with an example.
- How do you classify text using Bayes Theorem? Explain with an example.
- Define (i) Prior Probability (ii) Conditional Probability (iii) Posterior Probability
- Explain Brute force Bayes Concept Learning
- Explain the concept of EM Algorithm and mention its essence.
- Explain Naïve Bayes Classifier with an Example.
- Describe the concept of MDL.
- Explain 1) Bayes Optimal Classifier 2) Gibbs Algorithm and 3) Naïve Bayes Classification Algorithm.
- Discuss Maximum Likelihood and Least Square Error Hypothesis.
- Describe Maximum Likelihood Hypothesis for predicting probabilities.
- Explain the Gradient Search to Maximize Likelihood in a neural Net.
- Problems on Naïve Bayes

Module 5

- What is Reinforcement Learning? Explain the elements of reinforcement learning with a neat diagram.
- Explain the Q function and Q Learning Algorithm.
- Explain Radial Basis Function Networks with an example and mention the two stage process used to train the RBF.
- Describe K-nearest Neighbor learning Algorithm for continues valued target function.
- Discuss the major drawbacks of K-nearest Neighbor learning Algorithm and how it can be corrected.
- Explain Locally weighted Regression and derive local approximation for the Target Function.
- Problems on KNN.
- Explain Locally Weighted Linear Regression and derive global approximation for the target function.
- Explain the aspects which make Reinforcement Learning different from other.
- Explain Q learning algorithm assuming deterministic rewards and actions.
- Explain CADET System using Case based reasoning.
- Explain Binomial Distribution with an example.
- Explain Normal or Gaussian distribution with an example.

Binomial Distribution:

- Probability theory is a very powerful instrument for organizing, interpreting, and applying information.
- A discrete probability distribution that gives the probability of only two possible outcomes in n independent trails is known as Binomial Distribution.

Binomial Experiment :A Binomial experiment is an experiment in which there are a fixed number of trials (say n), every trial is independent of the others, only 2 outcomes: success or failure, and the probability of each outcome remains constant for trial to trial.

Binomial Probability: When there is given any binomial experiment in which we are performing random experiments multiple times, then finding out the probability of a certain outcome in n trials is called its binomial probability. Consider a binary experiment has n independent trials with two outcomes: Success and Failure. Now the Probability of getting r successes in n trials is:

$$P = {}^{n}C_{r}.p^{r}.q^{n-r}$$

where p = probability of success and q = probability of failure such that p + q = 1.