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Midsem Structure: Machine Learning (S2-19_DSECLZG565)

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Q1 –

A. Introduction and Math Prelims (Ref: Class notes/slides +Bishop) – 5 Marks

Problems + Conceptual questions

- Probability Theory – Problems
  - Problems on Probability Theory

B. Bayesian Learning – 5 Marks

Problems + Theory questions on this module

- Bayes Theorem (T1 book by Tom Mitchell -6.2)
  - Problems related to Bayes Theorem
- MAP Hypothesis (T1 book by Tom Mitchell -6.3) - Problems
- MLE Hypothesis (T1 book by Tom Mitchell -6.4) -Problems
- Minimum Description Length (MDL) principle
- Bayes optimal classifier and Gibbs Algorithm (T1 book by Tom Mitchell 6.7,6.8)

Q2

A. Naive Bayes Classifier – 5 Marks

Problems + Theory questions on this module

- Naïve Bayes Classifier (T1 book by Tom Mitchell 6.9)
- Text classification model (T1 book by Tom Mitchell - 6.9)
- Problems on Naïve Bayes Classier and Laplace smoothing

B. Logistic Regression – 5 Marks

Problems + Conceptual questions (class +Andrew Ng notes and Bishop - 4.1)

- Discriminant Functions
- Probabilistic Discriminative Classifiers
- Logistic regression
- Difference between Naïve Bayes Classifier and Logistic Regression

Q3

A. Linear Regression – 5 Marks

Problems + Conceptual questions on this module

- Regression (Andrew Ng Notes)
    - Problems related to simple linear regression
- Bayesian linear regression (6.4 Tom Mitchell)
- Linear basis function models (Class notes/slides)
- Bias-variance decomposition (Class notes/slides)

B. Decision Tree – 5 Marks

Problems + Conceptual questions on this module

- Decision Tree (Tom Mitchell Chapter 3)
    - Problems related to decision tree using information gain
- Handling overfitting (Class notes/slides)
- Continuous values (Class notes/slides)
- Missing Values(Class notes/slides)