

MACHINE LEARNING-23CSM241T

UNIT-I – INTRODUCTION TO MACHINE LEARNING

TWO-MARK QUESTIONS

1. Define Machine Learning.
2. What is the difference between Learning by Rote and Learning by Induction?
3. Define Reinforcement Learning with an example.
4. List different Paradigms for Machine Learning.
5. What is Feature Engineering?
6. What is Model Evaluation?
7. Give two examples for types of data used in ML.
8. What is Data Acquisition?
9. Define Model Prediction.
10. What is the role of Search in Learning?

TEN-MARK QUESTIONS

1. Explain the evolution of Machine Learning from traditional programming.
2. Discuss different Machine Learning paradigms with suitable examples.
3. Explain the various stages in a Machine Learning pipeline.
4. Compare Learning by Rote and Learning by Induction with real-time use cases.
5. Explain Reinforcement Learning with architecture and example.
6. What is Feature Engineering? Explain different techniques involved.
7. Explain Model Selection strategies with cross-validation techniques.
8. Discuss the importance of Data Acquisition and Data Representation in ML.
9. Write about different types of datasets used in ML along with examples.
10. Explain Model Learning, Evaluation and Prediction with a flow diagram.

UNIT-II – NEAREST NEIGHBOR-BASED MODELS

TWO-MARK QUESTIONS

1. Define Proximity Measure.
2. What is Euclidean Distance?
3. What are Non-Metric Similarity Functions?
4. Define K-Nearest Neighbor Classifier.
5. What is Radius Distance NN Algorithm?
6. What is KNN Regression?
7. List two advantages of KNN.
8. How is proximity between binary patterns measured?
9. What is the main drawback of KNN?
10. Define Performance Metrics for Classification.

TEN-MARK QUESTIONS

1. Explain different Distance Measures used in ML.
2. Discuss Proximity Measures for binary and continuous data.
3. Explain K-Nearest Neighbor Classification with algorithm and example.
4. Differentiate between KNN Classifier and KNN Regression.
5. Explain Radius Distance Nearest Neighbor Algorithm.
6. Discuss Non-Metric Similarity Functions with examples.
7. How to evaluate the performance of KNN Classifier?
8. Explain how K value selection affects accuracy in KNN.
9. Describe real-time applications of KNN in classification and regression.
10. Explain performance measures for Regression algorithms.

UNIT-III – DECISION TREES & BAYES CLASSIFIER

TWO-MARK QUESTIONS

1. What is a Decision Tree?
2. Define Impurity Measure.

3. What is Gini Index?
4. What is Random Forest?
5. Define Bias–Variance Trade-off.
6. State Bayes' Rule.
7. What is Naive Bayes Classifier?
8. Define Class Conditional Independence.
9. What is Entropy in Decision Trees?
10. What is Multi-class Classification?

TEN-MARK QUESTIONS

1. Explain the working of Decision Trees with an example.
2. Discuss various impurity measures used in Decision Trees.
3. Explain Regression based on Decision Trees.
4. What is Bias–Variance Trade-off? Explain with illustration.
5. Explain Random Forests for classification and regression.
6. Derive Bayes' Rule and explain its importance.
7. Explain the Bayes Classifier and its optimality.
8. Discuss Naive Bayes Classifier with assumptions and example.
9. Compare Decision Tree and Naive Bayes models.
10. Explain multi-class classification using Bayes approach.

UNIT-IV – LINEAR DISCRIMINANTS & NEURAL MODELS

TWO-MARK QUESTIONS

1. Define Linear Discriminant.
2. What is Perceptron?
3. Define Hyperplane.
4. What is Support Vector Machine?
5. What is Kernel Trick?

6. Define Logistic Regression.
7. What is Backpropagation?
8. What is Linearly Non-Separable Case?
9. Define MLP.
10. What is Linear Regression?

TEN-MARK QUESTIONS

1. Explain Linear Discriminants for classification with equation.
2. Describe Perceptron learning algorithm with flowchart.
3. Discuss SVM architecture and working.
4. Explain the difference between Linear and Non-linear SVM.
5. Write in detail about Kernel Trick with examples.
6. Explain Logistic Regression with derivation.
7. Describe Linear Regression algorithm with implementation steps.
8. What is Multi-Layer Perceptron? Explain structure and working.
9. Explain Backpropagation algorithm for training an MLP.
10. Compare Perceptron, SVM and Logistic Regression.

UNIT-V – CLUSTERING MODELS

TWO-MARK QUESTIONS

1. Define Clustering.
2. What is Partitioning Method?
3. Define K-Means Clustering.
4. What is Soft Clustering?
5. Define Fuzzy C-Means.
6. What is Spectral Clustering?
7. Define Agglomerative Clustering.
8. What is Divisive Clustering?

9. What is Rough Clustering?

10. What is EM-Based Clustering?

TEN-MARK QUESTIONS

1. Explain various types of Clustering techniques.
2. Compare Partitional and Hierarchical Clustering.
3. Explain K-Means Clustering algorithm with example.
4. Discuss Soft Partitioning and Soft Clustering in detail.
5. Explain Fuzzy C-Means Clustering with step-wise procedure.
6. What is Rough K-Means Clustering? Explain with algorithm.
7. Describe EM-Based Clustering with Gaussian Mixture Models.
8. Explain Spectral Clustering with mathematical formulation.
9. Compare K-Means, Fuzzy C-Means and Rough Clustering.
10. Discuss Clustering evaluation metrics.