

Machine Learning

Unitwise Important Questions

Unit-1

Introduction

1. Define learning, machine learning ? What is need of machine learning to today's society?
2. Explain Applications and issues in machine learning?
3. Define useful perspective on machine learning?
4. What is an influence of information theory on machine learning? What is meant by target function of a learning program?
5. Illustrate general to specific ordering of hypotheses in concept learning?
6. Explain the key properties of FIND-S algorithm for concept learning with necessary example and Describe hypothesis space search by FIND-S algorithm?
7. What is version space and explain its characteristics, Advantages, disadvantages ? Explain Candidate elimination algorithm with example?
8. What is an inductive Bias explain with an example?
9. What is decision tree ? explain its characteristics, Advantages, disadvantages and write decision tree algorithm?
10. Define a) input variable b) leaf node c) internal nodes d) depth e) information gain f) gini index g) entropy
11. Explain ID3 algorithm?
12. Discuss Hypothesis space search in Decision tree learning.
13. State Occam's razor principle and Candidate elimination algorithm?
14. Explain issues in Decision tree learning ? Define pre pruning, post pruning, Gini impurity?

UNIT-2

Artificial Neural Network

1. What is artificial neural network? Explain its applications, characteristics, advantages, disadvantages? Explain with diagram representation of neural networks?
2. Explain neural network architectures? Difference between digital computer and neural network?
3. What is perceptions Discuss the representable power of perception?
4. Explain gradient descent algorithm and steepest descent algorithm?
5. Explain delta learning rule for multi perception layer?
6. Explain brief architecture of multi layer feed – forward neural network?
7. What is back propagation and back propagation learning rule?
8. Explain error back back propagation algorithm and its advantages and disadvantages?
9. Explain remarks on the back propagation algorithm?

10. Explain face Recognition with an example?
11. What is a) RRN b) hypotheses c) sample error d) true error e) random variable f) probability distribution g) central limit theorem h) binomial distribution and its properties
12. Discuss in brief about Confidence intervals ?
13. What is p-value ? how it helps in hypothesis testing?
14. What is hypotheses testing and explain its steps and assumptions?
15. Discuss paired-t test ? Explain type I and type II errors?

UNIT-3

Bayesian learning, Computational learning and instance based learning

1. What is Bayesian neural network? What are features of Bayesian learning methods?
2. What is bayes theorem? How to select hypotheses?
3. Briefly discuss maximum likelihood estimation and least squared error hypotheses?
4. Explain minimum Description length principle?
5. Briefly explain bayes optimal classifier and Gibbs Algorithm?
6. What is naïve bayes classifier ? Explain with an example?
7. What is Bayesian belief networks? Explain with an example?
8. Discuss briefly probably approximately correct learning?
9. Define consistent learner and mistake bound model?
10. What is a) Euclidean distance b) mahalanobis distance c) computational learning theory
11. Explain VC dimension and weighted majority algorithm?
12. What is KNN algorithm Explain with an example? Advantages and disadvantages of KNN algorithm?
13. What is radial basis function network explain its architecture ? and explain its features?
14. Write short note on locally weighted regression?
15. What is case based reasoning ? explain its steps? Explain lazy and eager learner techniques?

UNIT-4

Genetic Algorithm

1. What is genetic Algorithm and its components ? List the factors motivated the popularity of genetic Algorithms? Give an example for fitness function in genetic algorithms?
2. Explain the "Darwinian theory of survival"? Compare genetic algorithm with traditional algorithm?

3. What is a) crossover operator b) two point crossover c) crowding d) Baldwin effect e) Lamarckian evolution
4. What is genetic programming?
5. Explain parallelizing genetic algorithm?
6. What is a) learning rule b) sequential covering algorithms c) first order learning problems d) LEARN ONE RULE Algorithm.
7. Why to learn first order rules?
8. Discuss about FOIL and its advantages and disadvantages.
9. Explain why induction is the inverse of deduction?
10. What is inverting resolution ? explain.
11. What is reinforcement learning? And various elements in reinforcement learning?
12. What is Q-learning ? define learning task
13. Discuss non deterministic rewards and actions of Q-learning?
14. What is Temporal Difference Learning ? Explain

UNIT-5

Analytical Learning

1. What is analytical learning and inductive learning ? explain difference between analytical learning and inductive learning?
2. What is domain theory?
3. Discuss prolog EBG Algorithm ?its properties? is it deductive or inductive?
4. What is Explanation based learning ? explain its phases ,remarks, elements?
5. Explain knowledge level learning?
6. What is prior knowledge? Explain TANGENT PROP Algorithm?
7. What is FOCL and FOIL? Explain difference between FOCL and FOIL?
8. What is combining inductive and analytical learning?
9. Briefly explain KBANN algorithm?