# SNS College of Technology

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COIMBATORE-641 035, TAMIL NADU

## DEPARTMENT OF MANAGEMENT STUDIES

Academic Year : 2023-24 Semester : 02

Course Code : 23BAT615

Course Name : Artificial Intelligence for Managers

Unit : II – Unboxing ML & Its Applications

### Questions [2 Marks]

1. What is machine learning?

   Machine learning is a subset of artificial intelligence (AI) that enables systems to learn from data without being explicitly programmed.

2. Define supervised learning.

   Supervised learning is a type of machine learning where the algorithm learns from labeled data, meaning it is provided with input-output pairs during training.

3. Give an example of supervised learning.

   Predicting house prices based on features like size, number of bedrooms, and location.

4. What is unsupervised learning?

   Unsupervised learning is a type of machine learning where the algorithm learns patterns from unlabeled data without explicit supervision.

5. Provide an example of unsupervised learning.

   Clustering similar documents in a large dataset based on their content.

6. What are ensemble techniques in machine learning?

   Ensemble techniques combine multiple models to improve predictive performance.

7. Name one ensemble technique.

   Random Forest.

8. What is a recommendation system?

   A recommendation system is a type of machine learning algorithm that predicts a user's preferences or interests based on past interactions.

9. Give an example of a recommendation system.

Netflix suggesting movies based on a user's watch history and ratings.

10. Define reinforcement learning.

Reinforcement learning is a type of machine learning where an agent learns to make decisions by interacting with an environment to maximize cumulative rewards.

11. Provide an example of reinforcement learning.

Training a computer program to play a game like chess or Go.

12. What is the importance of data preprocessing in machine learning?

Data preprocessing involves cleaning, transforming, and preparing data for analysis, which is crucial for ensuring the accuracy and reliability of machine learning models.

13. Explain overfitting in machine learning.

Overfitting occurs when a model learns the training data too well, capturing noise and irrelevant patterns, which leads to poor performance on unseen data.

14. How can overfitting be addressed in machine learning?

Overfitting can be addressed by techniques such as cross-validation, regularization, and using more training data.

15. What is cross-validation?

Cross-validation is a technique used to assess the performance of a machine learning model by splitting the data into multiple subsets, training the model on some subsets, and testing it on others.

16. What is regularization?

Regularization is a technique used to prevent overfitting by adding a penalty term to the model's objective function, discouraging overly complex models.

17. Explain the bias-variance tradeoff in machine learning.

The bias-variance tradeoff refers to the balance between a model's ability to capture the underlying patterns in the data (bias) and its sensitivity to fluctuations in the training data (variance).

18. What are the different evaluation metrics used in machine learning?

Evaluation metrics include accuracy, precision, recall, F1-score, ROC-AUC, and mean squared error, among others.

19. Define clustering in unsupervised learning.

Clustering is a technique used to group similar data points together based on their features or characteristics.

20. Give an example of clustering.

Grouping customers based on their purchasing behavior for targeted marketing campaigns.

21. What is dimensionality reduction?

Dimensionality reduction is a technique used to reduce the number of features in a dataset while preserving its essential information.

22. Name one dimensionality reduction technique.

Principal Component Analysis (PCA).

23. Explain collaborative filtering in recommendation systems.

Collaborative filtering is a recommendation technique that predicts a user's preferences by leveraging the preferences of similar users or items.

24. What is Q-learning in reinforcement learning?

Q-learning is a model-free reinforcement learning algorithm used to learn optimal policies by estimating the value of state-action pairs.

25. What is deep learning?

Deep learning is a subset of machine learning that utilizes artificial neural networks with multiple layers to learn complex patterns from data.

26. Give an example of a deep learning application.

Image recognition, such as identifying objects in photographs.

27. Explain the concept of transfer learning.

Transfer learning is a technique where knowledge gained from solving one problem is applied to a related but different problem, often by fine-tuning pre-trained models.

28. What is the role of hyperparameters in machine learning?

Hyperparameters are parameters that are not learned by the model but are set before the learning process begins and affect the model's behavior and performance.

29. Define a decision tree.

A decision tree is a supervised learning algorithm that partitions the feature space into a tree-like structure to make decisions based on feature values.

30. Explain ensemble learning.

Ensemble learning is a machine learning technique that combines multiple models to improve predictive performance, robustness, and generalization.