School of Computer Science & Engineering

Assignment: 01

Subject Name: Introduction to Machine Learning   **Subject code: AIML304**
Semester: IIInd   **Branch: AIML**

Short questions:

1. What do we mean by machine learning in the field of artificial intelligence?
2. How can learning be defined from a machine's perspective?
3. What methods are commonly used to evaluate the performance of machine learning models?
4. Why is it important to divide data into training and testing sets during model development?
5. What does the process of cross-validation involve in model evaluation?
6. What are feature sets, and how do they influence the learning process of a model?
7. Why is a validation set necessary, and how is it different from test and training sets?
8. What is the purpose of splitting a dataset into multiple subsets before training a model?
9. What are the key signs that a model is overfitting the training data?
10. How does a machine learning model learn from patterns in data?
11. In machine learning, what constitutes a dataset and what elements does it typically include?
12. How does cross-validation improve the generalization ability of a model?
13. What are the main evaluation metrics used to measure a model's accuracy and reliability?
14. How do training and testing datasets differ in their roles and usage?
15. What Datasets and we can explain it?

Long Questions:

1. Explain the history and evolution of machine learning with examples.
2. What is machine learning, how does it differ from traditional rule-based programming, and why is it considered a core part of artificial intelligence?
3. How do we define "learning" in the context of machine learning systems, and what are the key components that enable a model to learn from data?
4. What are the different evaluation methods used in machine learning, and how do they help in assessing the quality and performance of a model?
5. How does a neural network or machine learning model learn during training, and what are the main stages involved in this process?
6. What exactly are datasets in machine learning, and how should they be collected, cleaned, and structured for effective model training?

7. Why is proper handling of real-world datasets important, and what challenges might arise in ensuring they are balanced, relevant, and accurate?

8. What are feature sets in machine learning, and how does the selection, transformation, or extraction of features impact model performance?

9. How is a dataset typically divided into training, validation, and testing sets, and what specific role does each set play in model development and evaluation?

10. What is cross-validation, how is it performed, and why is it considered a reliable technique for model evaluation and tuning?