Assignment Code: DA-AG-011

Unsupervised Learning, Anomaly Detection, and Temporal Analysis | **Solution**

Instructions: Carefully read each question. Use Google Docs, Microsoft Word, or a similar tool to create a document where you type out each question along with its answer. Save the document as a PDF, and then upload it to the LMS. Please do not zip or archive the files before uploading them. Each question carries 20 marks.

Total Marks: 200

Question 1 : What is Dimensionality Reduction? Why is it important in machine learning?

Answer:

Question 2: Name and briefly describe three common dimensionality reduction techniques..

Answer:

Question 3: What is clustering in unsupervised learning? Mention three popular clustering algorithms.

Answer:

Question 4: Explain the concept of anomaly detection and its significance.

Answer:

Question 5: List and briefly describe three types of anomaly detection techniques.

Answer:

Question 6: What is time series analysis? Mention two key components of time series data.

Answer:

Question 7: Describe the difference between seasonality and cyclic behavior in time series.

Answer:

Question 8: Write Python code to perform K-means clustering on a sample dataset. (Include your Python code and output in the code box below.)

Answer:

Question 9: What is inheritance in OOP? Provide a simple example in Python.

Answer:

Question 10: How can time series analysis be used for anomaly detection?

Answer: