

DIPLOMA IN ARTIFICIAL INTELLIGENCE (2nd Semester)

ASSIGNMENTS



**Centre for Distance and Online Education
Guru Jambheshwar University of Science
& Technology, Hisar – 125001
(2026-2027)**

**CENTRE FOR DISTANCE AND ONLINE EDUCATION (CDOE)
GURU JAMBHESHWAR UNIVERSITY OF SCIENCE & TECHNOLOGY, HISAR**

**Course: Database Management System
Paper Code: DAI-21-T**

**Semester: 1st
Total Marks=30**

Important Instructions

- I. Attempt all questions from each assignment given below.**
- II. Each assignment carries 15 marks.**
- III. All questions are to be attempted in legible handwriting on plane white A-4 size paper.**

ASSIGNMENT-I

- Q1. What is the difference between a file system and a database system? Explain the main features that make a database system different from a traditional file system.
- Q2. What are the main duties and responsibilities of a Database Administrator (DBA)? Explain how these responsibilities help in managing and maintaining a database effectively.
- Q3. What do you mean by entity types, attributes, and relationships in the E-R model? Explain how these components are represented using an E-R diagram.

ASSIGNMENT-II

- Q1. Explain the process of normalization. What are database anomalies, and how does normalization help eliminate them?
- Q2. Describe the ACID properties of transactions in database systems. Why are these properties essential for maintaining the integrity of a database?
- Q3. Discuss the significance of locking techniques and time-stamp ordering in maintaining data consistency.

Prepared by:
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CENTRE FOR DISTANCE AND ONLINE EDUCATION

GURU JAMBHESWAR UNIVERSITY OF SCIENCE AND TECHNOLOGY, HISAR

Nomenclature: Fuzzy Logic and Neural Networks

Semester: 2nd

Code: DAI-22-T

Total Marks: 30

Important Instructions:

- 1) Attempt all Questions each assignment given below
- 2) Each assignment carries 15 marks
- 3) All questions are to be attempted in legible handwriting on plane white A-4 size paper and upload the scanned copy of the assignments on student's portal

Assignment – I

- Q.1 What is Fuzzy Logic? Explain the difference between crisp logic and fuzzy logic with simple example. 5
- Q.2 Define a Fuzzy Set and Membership Function. Explain common membership functions such as triangular and trapezoidal functions with suitable examples. 5
- Q.3 Explain the basic operations on fuzzy sets, including union, intersection and complement. Illustrate each operation with a simple example. 5

Assignment - II

- Q.1 Explain Fuzzy Relations and their role in representing relationships between uncertain or imprecise data. Give a suitable example. 5
- Q.2 What is a Fuzzy Inference System? Explain its main stages—fuzzification, rule evaluation, inference and defuzzification—in a simple manner. 5
- Q.3 Explain Hebbian Learning and Competitive Learning in neural networks. Compare their basic learning approaches and mention one application of each. 5

Prepared By:

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**CENTRE FOR DISTANCE AND ONLINE EDUCATION
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Course Name: Machine Learning
Paper Code: DAI-23-T

Semester: 2nd
Max. Marks: 30

Important Instructions:

- 1) Attempt all questions from each assignment given below.
- 2) Each assignment carries 15 marks.
- 3) All questions are to be attempted in legible handwriting on plane white A-4 size paper and same is uploaded through login your account.

ASSIGNMENT-I

- Q1. What is Machine Learning? Explain its concept, objectives, major types, and important applications in real-world domains.
- Q2. Explain the need and importance of preprocessing in machine learning. Discuss the major preprocessing techniques used to prepare raw data for analysis and model development.
- Q3. Discuss model selection, model training, model representation, interpretability, and performance evaluation in detail.

ASSIGNMENT-2

- Q1. Explain the K-Nearest Neighbour (KNN) and Decision Tree classification algorithms in detail. Discuss their working principles, advantages, disadvantages, and applications.
- Q2. What is Clustering? Explain the concept and objectives of clustering. Discuss the different types of clustering techniques and their applications in real-world data analysis.
- Q3. What are Association Rules? Discuss the major steps involved in finding useful associations in large datasets with suitable examples.

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**CENTRE FOR DISTANCE AND ONLINE EDUCATION
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**Course Name: Natural Language Processing
Paper Code: DAI-24-T**

**Semester: 2nd
Max. Marks: 30**

Important Instructions:

- 1) Attempt all questions from each assignment given below.
- 2) Each assignment carries 15 marks.
- 3) All questions are to be attempted in legible handwriting on plane white A-4 size paper and same is uploaded through login your account.

ASSIGNMENT-I

- Q1. What is Natural Language Processing (NLP)? Explain its definition, scope, importance in human-computer interaction, and major applications.
- Q2. What is Text Preprocessing? Explain its importance in NLP and discuss text normalization, tokenization, stopword removal, word standardization, and handling noise in text.
- Q3. Explain different techniques for representing text as numerical data.

ASSIGNMENT-2

- Q1. Discuss grammatical structure, POS tagging, syntactic ambiguity, constituency parsing, dependency parsing, and shallow parsing (chunking).
- Q2. Discuss major NLP tasks and their applications in real-world systems.
- Q3. Discuss rule-based, statistical, and neural language models, along with their major characteristics and applications.

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**CENTRE FOR DISTANCE AND ONLINE EDUCATION
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Course Name: Data Analytics
Paper Code: DAI-25-T

Semester: 2nd
Max. Marks: 30

Important Instructions:

- 1) Attempt all questions from each assignment given below.
- 2) Each assignment carries 15 marks.
- 3) All questions are to be attempted in legible handwriting on plane white A-4 size paper and same is uploaded through login your account.

ASSIGNMENT-I

- Q1. Explain the importance of Data Analytics and discuss the different types of analytics with suitable examples.
- Q2. Explain the regression equation in Simple Linear Regression. How does Multiple Linear Regression differ from Simple Linear Regression?
- Q3. What is Logistic Regression? Explain the logistic response function and the concept of logit.

ASSIGNMENT-2

- Q1. Explain the basic architecture of a data stream. Discuss the need for sampling and filtering in stream data.
- Q2. What are Real-Time Analytics? Explain the major applications of a Real-Time Analytics Platform (RTAP).
- Q3. Explain Exploratory Data Analysis (EDA). Discuss how visualization can be used to examine single and multiple variables and identify dirty data.

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CENTRE FOR DISTANCE AND ONLINE EDUCATION
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HISAR

Course Name: DBMS Lab

Code: DAI-26-P

Semester: 2nd

Max. Marks: 30

Important Instructions

1. Attempt these experiments/assignments.
2. All assignments are to be completed either in legible handwriting on plain white A4-size paper or typed in a Word file, along with appropriate screenshots of the output of the respective assignments. Practical file must be uploaded on the LMS portal

- 1. Create a database table, add constraints (primary key, unique, check, not null) using SQL commands**
- 2. Insert rows, update and delete rows using SQL commands.**
- 3. Create a set of tables, add foreign key constraints and incorporate referential integrity.**
- 4. Query the database tables using different where clause conditions and also implement aggregate functions.**
- 5. Query the database tables and explore sub queries and simple join operations.**
- 6 Query the database tables and explore natural, equi and outer joins.**
- 7. Write user defined functions and stored procedures in SQL.**
- 8. Execute complex transactions and realize DCL and TCL commands.**
- 9. Write SQL Triggers for insert, delete, and update operations in a database table.**
- 10. Create view and index for database tables with a large number of records.**

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CENTRE FOR DISTANCE AND ONLINE EDUCATION
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Course Name: Data Analytics Lab
Code: DAI-27-P

Semester: 2nd
Max. Marks: 30

Important Instructions

1. Attempt any eight experiments/assignments.
2. All assignments are to be completed either in legible handwriting on plain white A4-size paper or typed in a Word file, along with appropriate screenshots of the output of the respective assignments. Practical file must be uploaded on the LMS portal.

List of experiments/assignments:

- Q1. Write a program in Python for cleaning and handling missing values in dataset and data normalization.
- Q2. Write a program to perform descriptive statistics.
- Q3. Write a program for creating line charts, bar plots, scatter plots, and histograms.
- Q4. Write a program for hypothesis testing.
- Q5. Write a program for linear regression analysis.
- Q6. Write a program for logistic regression analysis.
- Q7. Write a program for binary classification.
- Q8. Write a program for model evaluation using accuracy, precision, recall, F1-score.
- Q9. Write a program for test processing.
- Q10. Write a program for cross validation.