DHA SUFFA UNIVERSITY

Department of Computer Science

CS/DS-3102L, 6C

Course Title: Artificial Intelligence

Project (15-MARKS)

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1. Project Idea and Selection

- **Choose a Problem Statement:** Identify a machine learning problem that interests you, such as classification, regression, or clustering, and ensure it aligns with the project requirements.
- **Define Objectives:** Clearly outline the goals you aim to achieve with your machine learning model, such as improving accuracy, making predictions, or solving a specific real-world problem.

2. Data Collection and Preparation

- **Collect Data:** Gather relevant data from reliable sources. This can include datasets from online repositories or data you collect yourself.
- **Data Cleaning:** Preprocess the data to handle missing values, remove duplicates, and correct inconsistencies.
- **Data Transformation:** Normalize or standardize the data and perform feature engineering to enhance the model's performance.

3. Exploratory Data Analysis (EDA)

- **Analyze Data:** Use statistical methods and visualization tools to understand the data distribution, identify patterns, and uncover insights.
- **Identify Relationships:** Look for correlations between features and the target variable to inform your feature selection process.

4. Model Selection and Development

- **Choose Algorithms:** Select appropriate machine learning algorithms that fit your problem, considering factors like model complexity and interpretability.
- **Train Models:** Split your data into training and testing sets, and train multiple models to compare their performance.

5. Model Evaluation and Tuning

- **Evaluate Performance:** Prediction on Test Set, use metrics such as accuracy, precision, recall, F1-score, and confusion matrix to assess model performance.

6. Model Deployment

- **Deploy Model:** Integrate your trained model into a website or application for real-time detection or predictions. Ensure it is accessible and functional for end-users.

7. Model Interpretation and Insights

- **Interpret Results:** Analyze the trained model to understand its decision-making process. Use techniques like feature importance or SHAPE values.
- **Draw Conclusions:** Summarize the findings and insights gained from your model, highlighting its strengths and potential limitations.

8. Presentation Preparation

- **Prepare Visuals:** Create visual aids such as charts, graphs, and slides to effectively communicate your project's results and methodologies.
- **Practice Presentation:** Rehearse your presentation to ensure clarity and confidence in explaining your project to an audience.

9. Final Submission and Presentation

- **Submit the Project:** Turn in your completed project report and code by the deadline.
- **Present Your Work:** Deliver your presentation to the intended audience, focusing on key aspects like the problem, methodology (with code), results, and potential applications.