**National University of Computer & Emerging Sciences, Karachi Computer Science Department**

**Summer 2023, Lab Manual – 07**

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| **Course Code: AI-2002** | **Course: Artificial Intelligence Lab** |
| **Instructor(s):** | **Sania Urooj** |

**Lab Tasks**

1. Implement linear regression using least square from scratch (Refer to Kaggle for house price dataset).
2. Implement k-means to mall customers dataset.
3. The bank, ABC Bank, wants to automate its loan approval process using a classification algorithm. They have a large dataset of historical loan applications that includes various features such as the applicant's income, credit score, loan amount, employment status, existing debts, and more.

ABC Bank gathers data from previous loan applications, including details such as income, credit score, loan amount, employment status, existing debts, loan term, and whether the loan was approved or not. The collected data is preprocessed to handle missing values, outliers, and inconsistencies. ABC Bank analyzes the collected data and identifies the relevant features that have a significant impact on loan approval. Using the selected features, ABC Bank trains a classification algorithm. The model learns the patterns and relationships between the input features and loan approval outcomes. The trained model is evaluated using various performance metrics, such as accuracy, precision, recall, and F1-score. ABC Bank ensures that the model performs well on both the training and evaluation datasets, indicating its ability to generalize to new loan applications.