# Data Mining Lab Assignment-10
## CSE 6th semester
## (Language/Platform: Python)

**Objective:01**

Build a Binary Classifier using ANN (Artificial Neural Network) with Back propagation. Load the Breast Cancer dataset and implement an artificial neural network using TensorFlow/Keras for binary classification (malignant vs benign tumors).

- Preprocess the data (normalization, train-test split)
- Implement the neural network with at least one hidden layer and use backpropagation to update the weights during training
- Evaluate the model using accuracy, confusion matrix, and discuss how backpropagation helps in learning from the errors during training.

**Objective:02**

Implement a K-Nearest Neighbors (KNN) classifier on the Iris dataset to classify the types of iris flowers.

- Experiment with different values of k (e.g., k=3, 5, 7)
- Use Euclidean distance and plot the decision boundary for different k values
- Evaluate the model's performance using accuracy and confusion matrix
- Discuss the advantages and limitations of KNN compared to ANN with backpropagation, especially in terms of training time and complexity.

**Objective:03**

Comparing KNN and ANN for Classification Tasks. Train both a K-Nearest Neighbors (KNN) and a Neural Network (ANN) on the same dataset (e.g., Iris or MNIST).

- Compare performance metrics such as accuracy, precision, recall, and F1-score
- Discuss the training time and model complexity differences between KNN (non-parametric) and ANN (parametric, trained with backpropagation).