**Objective:**

The objective of this assessment is to evaluate your understanding and ability to apply supervised learning techniques to a real-world dataset.

**Dataset:**

Use the breast cancer dataset available in the sklearn library.

**Key components to be fulfilled:**

**1. Loading and Preprocessing (2 marks)**

* Load the breast cancer dataset from sklearn.
* Preprocess the data to handle any missing values and perform necessary feature scaling.
* Explain the preprocessing steps you performed and justify why they are necessary for this dataset.

**2. Classification Algorithm Implementation (5 marks)**

* Implement the following five classification algorithms:  
  **1. Logistic Regression  
  2. Decision Tree Classifier  
  3. Random Forest Classifier  
  4. Support Vector Machine (SVM)  
  5. k-Nearest Neighbors (k-NN**)
* For each algorithm, provide a brief description of how it works and why it might be suitable for this dataset.

**3. Model Comparison (2 marks)**

* Compare the performance of the five classification algorithms.
* Which algorithm performed the best and which one performed the worst?