**Assessment: KNN Model Implementation and Evaluation**

**Assessment Type: Individual, Performance-Based**

**Desired Skills Assessed:**

* Understanding of the KNN algorithm
* Ability to implement the KNN algorithm using a programming language (e.g., Python)
* Ability to evaluate the performance of a KNN model
* Skill in interpreting model results
* Critical thinking and problem-solving skills

**Time Allotment: 2 hours**

**Instructions:**

You are tasked with building a K-Nearest Neighbors (KNN) model to classify a given dataset.

**Dataset:** A dataset containing information about various types of flowers, including features like sepal length, sepal width, petal length, and petal width. The target variable is the species of the flower (Iris-setosa, Iris-versicolor, or Iris-virginica).

**Task:**

1. **Data Exploration:**
   * Load the dataset into your chosen programming environment (e.g., Python).
   * Explore the data using descriptive statistics and visualizations.
   * Identify any missing values or outliers.
   * Preprocess the data as necessary (e.g., handling missing values, normalization).
2. **Model Building:**
   * Split the dataset into training and testing sets.
   * Implement the KNN algorithm using a suitable library (e.g., scikit-learn).
   * Train the KNN model on the training set.
3. **Model Evaluation:**
   * Evaluate the performance of the model on the testing set using appropriate metrics (e.g., accuracy, confusion matrix).
   * Interpret the results and discuss the model's strengths and weaknesses.
4. **Model Improvement (Optional):**
   * Explore techniques to improve the model's performance, such as feature engineering or hyperparameter tuning.
   * Implement these techniques and re-evaluate the model.