

EE 658/758 Machine Learning in Engineering  
Spring 2024

Assignment #5

Due Date: Friday, April 26<sup>th</sup>, 2024

**Using Streamlit to Develop a Web app**

**Overview**

In this assignment, you will develop a web application using Python and Streamlit that allows users to interact with machine learning models. Your application will enable users to select between two datasets, the IRIS dataset, and the Digits dataset, choose a machine learning classifier, input feature values, and obtain predictions.

**Requirements**

1. Setup and Introduction:
  - Install Streamlit using pip.
  - Import necessary libraries for handling data and machine learning models (e.g., pandas, sklearn).
2. Data Handling:
  - Load the IRIS and Digits datasets from sklearn.datasets.
  - Provide an option for the user to select between these two datasets.
3. Model Selection:
  - Implement at least three machine learning classifiers (e.g., Logistic Regression, Neural Networks, Naïve Bayes).
  - Allow the user to select a classifier from the implemented options.
4. User Input:
  - Based on the selected dataset, dynamically generate input fields for the user to enter feature values. Ensure that input fields are appropriately labeled.
  - Validate the user inputs to ensure they are in the correct format and within acceptable ranges.

#### 5. Prediction:

- Once the user selects the dataset, classifier, and inputs all necessary feature values, provide a button to make predictions.
- Display the prediction result to the user in a clear and understandable manner.

#### 6. User Interface:

- Ensure the application is user-friendly and intuitive.
- Organize the layout such that the data selection, model selection, input fields, and prediction results are logically structured.

#### 7. Documentation:

- Comment on your code adequately to explain critical sections and choices made during development.
- Include a README file that explains how to run the application and provides a brief overview of its functionality.

#### Submission

- Submit the Python script file (.py) containing your Streamlit application.
- Include any additional files required to run the application .
- Ensure your application is fully functional and free from bugs before submission.

#### Evaluation Criteria

- **Functionality:** The application works as intended without errors.
- **User Experience:** The application is easy to use and navigate.
- **Code Quality:** The code is well organized, commented on, and adheres to best practices.
- **Creativity:** Additional features or innovative elements that enhance the application.