Programming Assignment - 1: Building a Machine Learning Application with Streamlit

Objective:

The objective of this assignment is to develop a machine learning application using Streamlit, which will include displaying media files, utilizing input widgets, showing progress and status updates, incorporating sidebars and containers, and visualizing data with graphs.

Instructions:

Project Overview:

- Develop a machine learning application using Streamlit.
- The application should perform a specific machine learning task (e.g., classification, regression, clustering).
- The application must include features to upload and display an image, video, or audio file.

Streamlit Features:

- Use Streamlit to display input widgets for user interaction.
- Implement progress and status updates within the application.
- Utilize the sidebar and container features in Streamlit.
- Display graphs to visualize data and results.

Requirements:

1. Machine Learning Task: Choose a machine learning task (e.g., image classification, sentiment analysis, etc.) and implement a model for it. (2 Marks)
2. Media Display: Allow users to upload and display an image, video, or audio file within the application/ Display an image which is relevant to the application. (1 Mark)
3. Input Widgets: Include input widgets such as sliders, buttons, and text inputs for user interaction. (1 Mark)
4. Progress and Status Updates: Show progress bars or status messages to inform users about the application's state (e.g., loading data, training model, making predictions). (1 Mark)
5. Sidebar and Container: Use Streamlit's sidebar to hold some of the input widgets or information. Use containers to organize different sections of the application. (1 Mark)
6. Graphs: Display graphs to visualize data, model performance, or other relevant information. (1 Mark)
7. GitHub Link with fully explainable README.md file. (1 Mark)
8. Deployment of Streamlit Application in Streamlit Cloud. (2 Marks)

Deliverables:

1. A fully functional Streamlit application meeting the above criteria.
2. A link to a GitHub repository (containing the application code) & deployed Streamlit Application.

Submission:

Submit your assignment through the LMS by 31/07/2024. Ensure your GitHub repository is public.

Evaluation Criteria:

1. Completeness: Meeting all the specified requirements.
2. Functionality: The application should run without errors and perform the intended task.
3. User Interface: The application should be user-friendly and well-organized.
4. Code Quality: The code should be clean, well-documented/commented, and follow best practices.

Learning Materials

1. https://docs.streamlit.io/get-started/tutorials/create-an-app
2. https://www.datacamp.com/tutorial/streamlit