Assignment: Image Content Classification Model

Objective:

Develop a machine learning model to classify images into three categories: 'Violent', 'Adult Content', and 'Safe'. Integrate the model into a Streamlit app to demonstrate its functionality in a live web interface.

Tools Required:

- **Python:** Main programming language.
- **TensorFlow/Keras:** For building and training the convolutional neural network (CNN).
- **NumPy:** For data manipulation and preprocessing.
- **Matplotlib:** For creating visualizations.
- **Streamlit:** To create an interactive web app showcasing the model.

Key Steps:

1. **Environment Setup:**
    - Set up a Python environment and install necessary libraries: TensorFlow, NumPy, Matplotlib, and Streamlit.
2. **Data Collection & Preprocessing:**
    - Collect images from specified URLs and additional sources. Resize, normalize, and augment the images to prepare them for training.
3. **Model Development & Training:**
    - Construct a CNN using TensorFlow/Keras. Employ techniques like transfer learning to enhance the model's effectiveness and efficiency.
4. **Model Evaluation:**
    - Evaluate the model using metrics like accuracy, precision, recall, and F1-score to determine its performance across the defined categories.
5. **Streamlit Integration:**
    - Develop a Streamlit web app that allows users to upload images and view the classification results directly. Provide interactive elements to display model accuracy and other statistics.
6. **Reporting:**
    - Include code snippets and visualizations of model performance.

Submission Requirements:

- Submit the complete source code for the model github link and the Streamlink app.
- Provide a link to the Streamlit app deployed on a platform like Heroku or Streamlit Sharing, enabling live interaction with the model.

Deadline:

- All materials must be submitted by June 09, 2024.