**Assignment No: 2**

**Problem Statement:-**

Facial recognition using **OpenCV** and **deep learning** for binary classification.

**Theory:-**

Facial recognition is the process of identifying or verifying a person’s identity using their face. This can be done using OpenCV for image processing and deep learning techniques for classification.

* **Binary Classification**: For example, you may want to classify if a face is "Person A" or "not Person A".
* **Feature Extraction**: OpenCV can be used for detecting and extracting facial features.

**Methodology:-**

1. **Face Detection**:
   * Use **Haar Cascade** classifiers in OpenCV to detect faces in images or video streams.
   * Extract the region of interest (ROI) containing the face for further processing.
2. **Deep Learning Model**:
   * Use a simple **Convolutional Neural Network (CNN)** for binary classification.
   * The model will take the detected face as input and classify it as either "Person A" or "not Person A."
3. **Training**:
   * Prepare a dataset of labeled images, where some images belong to "Person A" and others do not.
   * Train the CNN model on this dataset using **Keras** or **TensorFlow**.
4. **Real-time Detection**:
   * Integrate the trained model with OpenCV to perform real-time face recognition from a webcam or video feed.

**Conclusion:-**

We implemented a facial recognition system using OpenCV for face detection and deep learning for binary classification. The system was able to distinguish between "Person A" and others with high accuracy.