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**Academic Year: 2023-24**

**Class: TYCM-Win Group No: 26 Date:**

**Title of Project: Attendance Monitoring system using Facial Recognition**

**Assignment No: 1**

**Name of Activity (Assignment): Detail Design**

**Name: Mrs.Y.U.Kadam**

**Signature of Guide:**

**Module-1 Detail Designing & Analysis**

1. **DFD Diagram:**

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**Fig. DFD Level-0**

In the Level 0 Data Flow Diagram (DFD) for the Student Attendance Management System using face recognition, the system is depicted as the central hub through which data flows between two primary actors: the teacher and the student. On the left side of the diagram, we have the teacher, who serves as the administrator and data manager. The teacher's role involves managing student data, which includes performance records and ratings. On the right side of the diagram, we have the student, who interacts directly with the system to mark their attendance using the face recognition feature.

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**Fig. DFD Level-1**

The Level 1 Data Flow Diagram (DFD) provides an overview of the key processes and data interactions within the system, focusing on login authentication, student data management, and secure logout procedures. The Login Check Process serves as the initial point of interaction for users attempting to access the system. Upon submission of login credentials, this process rigorously validates the provided information to authenticate users' identities. Utilizing secure authentication mechanisms such as username-password verification or biometric authentication, the system ensures that only authorized users gain entry. If the login credentials are deemed valid, users are granted access to interact with the system's functionalities. Following the completion of user interactions, the Logout Process offers a secure mechanism for terminating user sessions and exiting the system. By invalidating session tokens or cookies and clearing active session data, this process mitigates the risk of unauthorized access after logout. Overall, the Level 1 DFD underscores the importance of robust authentication, data management, and logout procedures in maintaining system security and user confidentiality. By orchestrating seamless interactions between these components, the system ensures a secure and efficient user experience while safeguarding sensitive data against potential threats and unauthorized access.

1. **UML Diagram**

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**Fig. UML Diagram**

* Beginning with the Load Image operation, the process initiates by retrieving the user's image for further manipulation. If the image is not readily available, the system proceeds to capture it from stored photo samples, ensuring a comprehensive dataset for analysis.
* Subsequently, the Face Detection operation utilizes a Haarcascade classifier to identify human faces within the loaded image. Once detected, the faces are cropped to isolate them from the background, a crucial step in preparing the data for analysis. These cropped images are then converted into grayscale to simplify feature extraction and reduce computational complexity.
* Moving forward, the Feature Extraction process extracts relevant features from the grayscale images, such as facial landmarks, textures, and shapes.
* The Create Database operation signifies the establishment of a database to store these extracted features.
* The training phase begins as the system leverages the collected data to train the face recognition model.
* Finally, during the Recognition phase, the system dynamically matches the features of faces detected in real-time with those stored in the classifier.xml file.