**INTRODUCTION:**

This code is a Python script for face recognition-based attendance recording system. It uses OpenCV and face\_recognition library for face detection and recognition tasks.

**MODULES INSTALLED:**

OpenCV: OpenCV is a powerful open-source computer vision library that can be used to detect faces in images and videos. It provides a pre-trained Cascade Classifier for face detection, which can be used out-of-the-box.

Dlib: Dlib is a machine learning library that can be used for face detection, among other tasks. It provides a pre-trained shape predictor for face detection, which can be used to detect faces in images and videos.

Face\_recognition: face\_recognition is a python library that provides an easy-to-use interface for face detection and Recognition. Modern facial recognition created with deep learning is used in the library by dlib.

CMake is used to control the software compilation process using simple platform and compiler independent configuration files, and generate native makefiles and workspaces that can be used in the compiler environment of your choice.

**ALGORITHM:**

The script then loads the images from the "Images" directory and encodes the faces in each image using the face\_recognition library. The encoded face data is appended to the encodedImagesList and the names of the images are appended to the listOfImageNames.

Next, the script creates a CSV file with the current date as the filename to store the attendance records. If a file with the same name already exists, it opens the file in "append" mode, otherwise it creates a new file and writes the header row with the column names "Student Names" and "Time of Attendance".

The script then enters into an infinite loop, where it reads frames from the video capture object and displays them in a window titled "Attendance Recorder". It also increments the frame count and checks if the current frame count is divisible by 72 (roughly equivalent to 3 seconds at a 24 fps frame rate).

If the condition is true, the script attempts to detect a face in the current frame using face\_recognition library. If a face is detected, the script encodes it and compares it with the list of known face encodings. If there is a match, the script highlights the face by drawing a rectangle around it and displays the name of the recognized person and a message indicating that their attendance has been recorded. It also writes the person's name and the current date and time to the CSV file.

If a face is detected but there is no match with the known face encodings, the script checks if the face has already been recorded by comparing it with the previously recorded face encodings. If there is a match, it displays the name of the recognized person and a message indicating that their attendance has already been recorded. If there is no match, it continues to the next frame.

The loop continues until the user presses the 'q' key, at which point the video capture object is released and the OpenCV windows are closed.

Overall, this script provides a simple and effective solution for attendance recording using face recognition technology.