RAPID PROTOTYPING PRACTICE USING OBJECT ORIENTED PROGRAMMING

(RPPOOP)

CT-20018

PROJECT NAME : Attendance Using Face Recognition System

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We are immensely grateful to **Mrs. Trishna Ugale** for her invaluable support and guidance throughout the development of our project. Her suggestion to incorporate the topic of generating QR codes to obtain user location added a significant dimension to our project. Not only did she provide us moral support, but she also patiently guided us through various aspects of the project, addressing all our doubts with kindness and patience. We thank her for her overall support.

I would also like to thank **Mrs. Vahida Attar** for her guidance and overall support. Her patience in explaining complex concepts, willingness to offer constructive feedback, and unwavering belief in our abilities truly inspired us to push our boundaries and strive for excellence. We would really thank her for her invaluable time and interest towards it.

Thanks

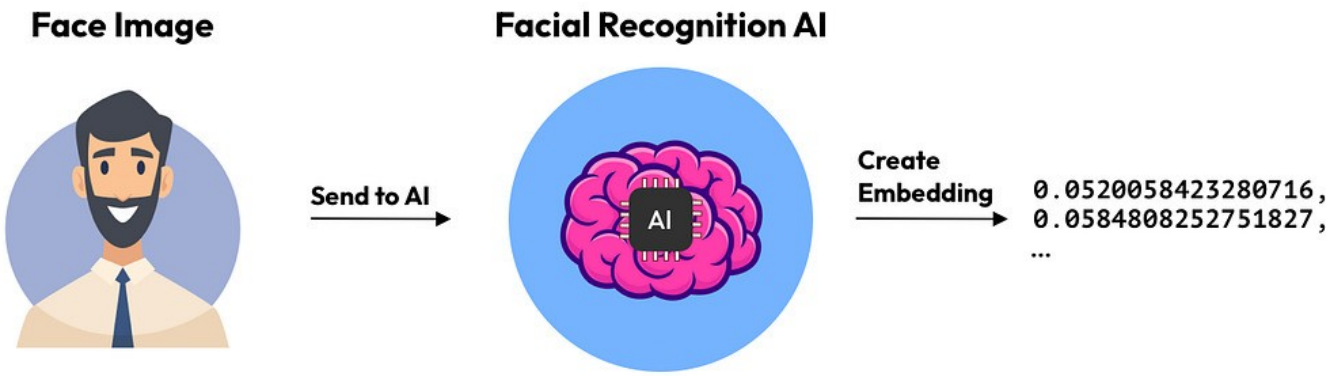
Regards

A LITTLE DETAIL ABOUT THE PROJECT

This project focuses on taking attendance in 2 ways, namely, Face Recognition system and by scanning QR code(filling google form) to get user location. Our project aims on integrating both of this technology.

1. **Face Recognition System:** Utilizes facial recognition technology to accurately identify and record attendance.
2. **QR Code Generation:** Generates google form with user information on scanning QR code to get user location.

The chief objective of the project is **using advance technologies for taking attendance over problems caused by manual attendance taking system.**



INTRO

We had seen the increased number of proxies in our class and wasting of time in lecture to identify those students.

This made us think for a solution to take attendance using this great advanced technology of integrating face recognition system and filling of google form on scanning QR code to get user location.

In this project, we have developed a platform where new users can input their details once. Whenever they appear in front of the webcam, attendance is marked via facial recognition. Additionally, users are required to scan a generated QR code and fill in the details to capture their location(to avoid photo attendance). Only when both actions are completed does the attendance get marked.

The project has also been extended by making a user interface which stores data in csv, as well as it shows the total attendance percentage.

The user data is manipulated further such that he can how much more lectures he need to get his attendance above 75%.

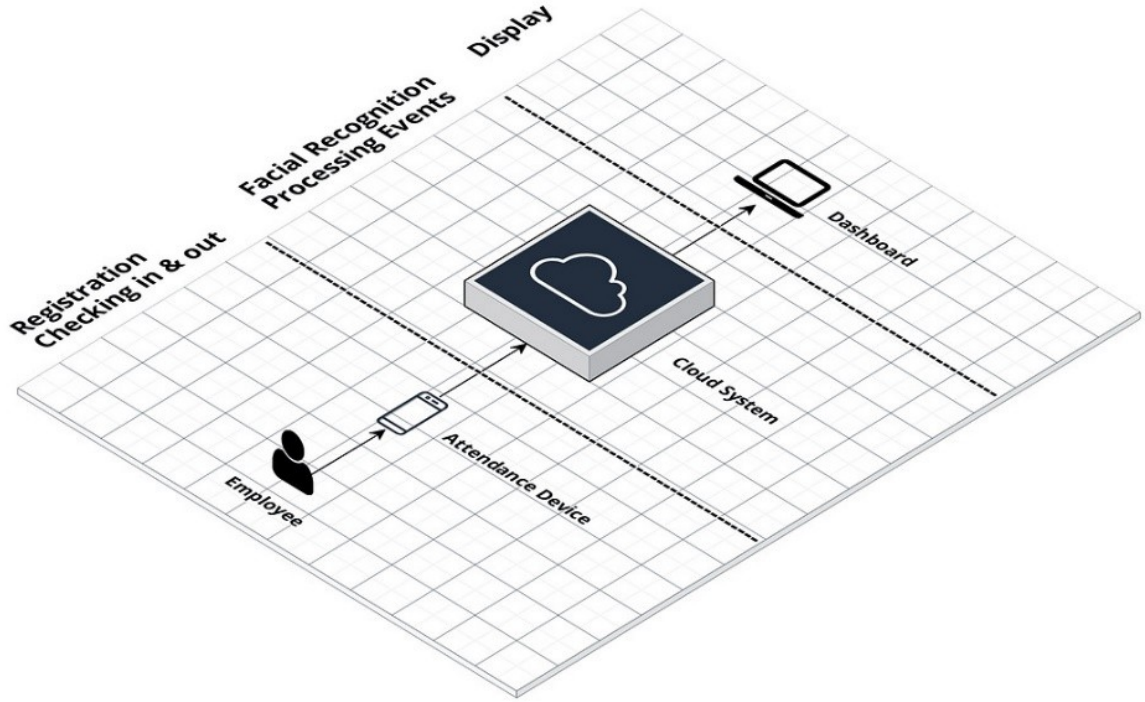
All this is being done in python(Flask) with concepts of OOPs

WORKING OF THE PROJECT

This topic is chosen because it addresses the modern need for efficient attendance tracking in various contexts, such as workplaces, educational institutions, and events.

By leveraging technologies like facial recognition and QR codes, the project offers a streamlined solution that enhances accuracy, reduces manual effort, saves time and provides valuable insights through data analytics.

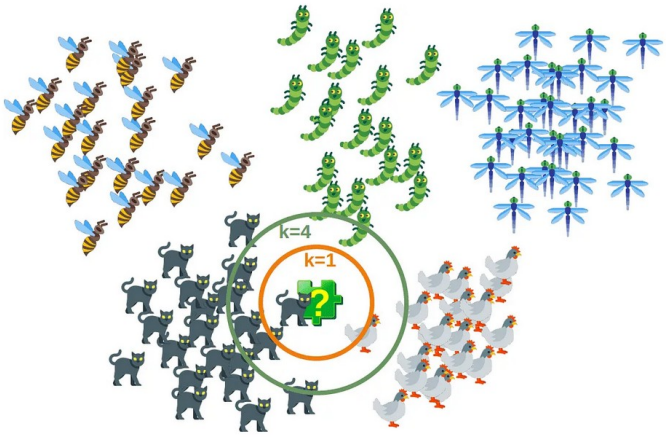
This project will help in reducing number of proxies in class. Additionally, ensuring compliance with data privacy regulations and continuously improving security measures align with contemporary concerns surrounding information security and privacy. Overall, this topic offers an opportunity to develop a practical and innovative solution to a common organizational challenge.



PHASES OF THE PROJECT:

1. Face Detection and Data Gathering
2. Train the Recognizer
3. Face Recognition

KNN ALGORITHM



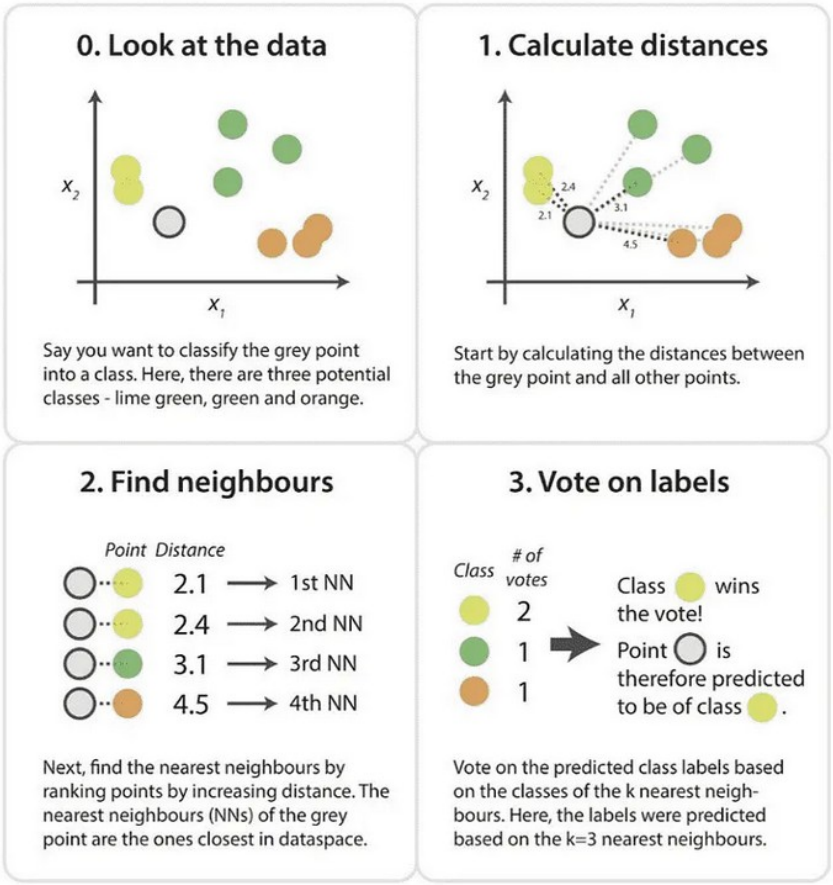
K-nearest neighbors (KNN) is a type of supervised learning algorithm used for both regression and classification.

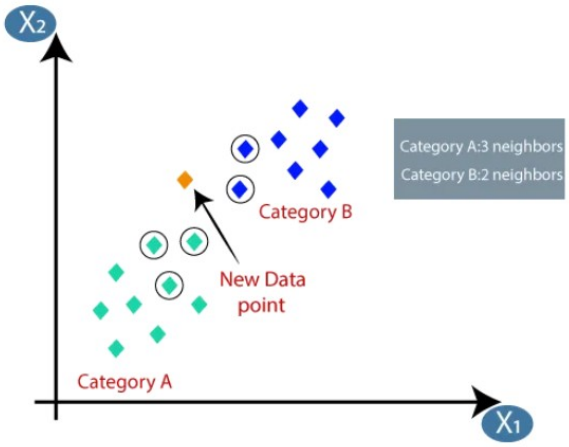
KNN tries to predict the correct class for the test data by calculating the distance between the test data and all the training points.

Then select the K number of points which is closet to the test data.

The KNN algorithm calculates the probability of the test data belonging to the classes of ‘K’ training data and class holds the highest probability will be selected.

In the case of regression, the value is the mean of the ‘K’ selected training points.





In our project, we took k=5.

KNN works by finding the distances between a query and all the examples in the data, selecting the specified number of examples (K) closest to the query, then voting for the most frequent label (in the case of classification) or averages the labels (in the case of regression).

SOURCE OF THE DATA SET

Our classmates, reference books and also a few websites.

ANALYTICS APPLIED

(i)Libraries Imported:

- Pandas
- Numpy
- Csv
- Scikit-learn
- Os
- Mysql.connector
- Openpyxl
- Joblib
- Cv2

FUTURE GOAL

- A future goal for this project could be to enhance its scalability, usability, and security.
- In future, this webpage can be changed to a user application with few modifications.
- Faculty can start the camera via the app for a specified duration, enabling it to record the video of entire class during that period.
- The recorded video would automatically identify students' faces and marks attendance accordingly.
- Further, the app provides faculty with a list of present students.
- This can help in reducing the time of lectures and also attendance will be taken more efficiently.

Thank You