**Tasks**

**1.Face Recognition Software:** The face recognition software is to recognise the face of the user and provide access to the room by unlocking the door. It uses camera detect the face and perform feature extraction and image classification.

**a)Face Detection**-:Human Face will be detected from an input image.Face detection went mainstream in the early 2000's when Paul Viola and Michael Jones invented a way to detect faces that was fast enough to run on cheap cameras. However, much more reliable solutions exist now. We’re going to use a method invented in 2005 called Histogram of Oriented Gradients — or just HOG for short.

**b)Normalize face landmarks**-:In a naive implementation there can be four separate convolutional neural networks (convNet) each responsible for each facial landmark.  
A more efficient approach would be to share the convolutional (conv) features and add a fully connected neural network at the end with a 4-way softmax output layer, let's call that network, the landmark detector. The four softmax outputs provide 4 probabilities corresponding to the 4 landmarks respectively.Afterwards, low confidence detections can be thresholded out and then apply non-maxima suppression (NMS) algorithm on the remaining detections so as to keep a single strongest detection around each landmark.

**c)Feature Extraction**-:It is not easy to extract features from facial images. Many factors such as, facial expression, imaging conditions, occlusion of facial features and presence or absence of facial elements such as, mustaches, beards, and glasses, that affects the performance of the algorithm.

**d)Facial Classification**-:We can do this by using any basic machine learning classification algorithm. We’ll use a simple linear SVM classifier, but lots of classification algorithms could work.All we need to do is train a classifier that can take in the measurements from a new test image and tells which known person is the closest match. Running this classifier takes milliseconds. The result of the classifier is the name of the person!

**2. Permission Request:** The new user can send the request to admin to unlock the door. The admin can decide whether to accept the request and give one time or permanent access rights. The admin can give permanent access rights by adding the new user. Permission request can also be used by new user in case of emergency situations by activating the SOS feature.

**a)Making Request-:**The locking system will be connected to the wifi of home and any new user can request to access the lock by sending his pick along with an audio message to the admin.

**b)Sending Request-:** After making the request successfully new user will need to send the request to the admin.Depending upon the picture and audio recorded sent,admin can make the decision weather to accept the request or reject it.

**c)Adding Extra features-:** Depending on the situation of SOS like fire etc,admin will also have option to make call to police ,ambulance,Fire Dept. etc

**3. Add New User:** The admin has the rights to add new user either on temporary or permanent basis. The admin can check the authentication requests from mobile or web applications which is connected.

**4. Making Website: eykey**

**5. Making Mobile Application:**