INDUSTRIAL TRAINING REPORT

ON

Project on Face Recognition, Encryption Decryption and Web App for Hostel Administration

A report submitted in partial fulfilment of the requirement for the award of

The degree of

BACHELOR OF TECHNOLOGY

In

COMPUTER SCIENCE AND ENGINEERING

Submitted By:-

Yash Saxena

Roll No: 170111049

Batch: 2017-21

Department of Computer Science and Engineering

DIT UNIVERSITY, DEHRADUN

(State Private University through State Legislature Act No. 10 of 2013 of Uttarakhand and approved by UGC)

Mussoorie Diversion Road, Dehradun, Uttarakhand - 248009, India.

2019

DECLARATION

I hereby certify that the work, which is being presented in the report/ project report, entitled **Project on Face Recognition, Encryption Decryption and Web App for Hostel Administration**, in partial fulfilment of the requirements for the award of the Degree of **Bachelor of Technology** and submitted to the institution is an authentic record of my own work carried out during the period ***20-May-2019*** to ***12-July-2019*.**

Date: **Signature of the Candidate**

Signature of Internal faculty Supervisor

ACKNOWLEDGEMENT

I have taken efforts in this project. However, it would not have been possible without the kind support and help of many individuals and organizations. I would like to extend my sincere thanks to all of them.

I am highly indebted to **Mr. Anuj Yadav, DIT University** for their guidance and constant supervision as well as for providing necessary information regarding the project & also for their support in completing the project.

I would also like to take this opportunity to thank our teachers for their continued understanding, active involvement, inspiration and patience.
My thanks and appreciations also go to my colleagues in developing the project and people who have willingly helped me out with their abilities.

Name-Yash Saxena
Rollno-170111049

ABSTRACT

The main objective of this project is to develop softwares using different languages which can be controlled by the user and by the administration also. As technology is advancing so we need to perform our operations/work online so that we can save our time and cost. Modern cities like Delhi and Mumbai and many more are shifting their whole work to online system and Presently,We are using hard copy sytem which is not much effiecient and these are also hard to maintain. Even more it becomes more difficult to maintain so many registers in a scenario of an organisation. So softwares provides a most modern solution to work online. In order to achieve this, user just need internet connection and a GUI application on the smartphone/laptops to make the work available online.

TABLE OF CONTENT

CHAPTER 1: ORGANIZATION OVERVIEW

INTRODUCTION

The Association for Computing Machinery (ACM) is an international learned society for computing. It was founded in 1947, and is the world's largest scientific and educational computing society. The ACM is a non-profit professional membership group, claiming nearly 100,000 student and professional members as of 2019. Its headquarters are in New York City.

The ACM is an umbrella organization for academic and scholarly interests in computer science. Its motto is "Advancing Computing as a Science & Profession".

The ACM Portal is an online service of the ACM Its core are two main sections: ACM Digital Library and the ACM Guide to Computing Literature

ACM adopted a hybrid Open Access (OA) publishing model in 2013. Authors who do not choose to pay the OA fee must grant ACM publishing rights by either a copyright transfer agreement or a publishing license agreement.

SERVICES PROVIDED BY ORGANIZATION

The ACM Digital Library is the full-text collection of all articles published by the ACM in its articles, magazines and conference proceedings. The Guide is a bibliography in computing with over one million entries. The ACM Digital Library contains a comprehensive archive starting in the 1950s of the organization's journals, magazines, newsletters and conference proceedings. Online services include a forum called Ubiquity and Tech News digest. There is an extensive underlying bibliographic database containing key works of all genres from all major publishers of computing literature. This secondary database is a rich discovery service known as The ACM Guide to Computing Literature.

There are many reasons to join ACM. When you become a member, you become a part of the dynamic changes that are transforming our world, by helping to shape the future of computing. ACM provides the tools and resources to help get you there, by advancing your career and enriching your knowledge with life-long learning resources.

Chapter 2: Introduction to Project

There are so many companies which are currently working various product development. If we take an example of big companies like adobe and many more so, it has developed a PDF reader software. Each and every company are developing their own multi-platform app which will help the user to perform complex task in a easy way.

Deep Learning

Deep learning (also known as deep structured learning or hierarchical learning) is part of a broader family of machine learning methods based on artificial neural networks. Learning can be supervised, semi-supervised or unsupervised.

Deep learning architectures such as deep neural networks, deep belief networks, recurrent neural networks and convolutional neural networks have been applied to fields including computer vision, speech recognition, natural language processing, audio recognition, social network filtering, machine translation, bioinformatics, drug design, medical image analysis, material inspection and board game programs, where they have produced results comparable to and in some cases superior to human experts.

Artificial Neural Networks (ANNs) were inspired by information processing and distributed communication nodes in biological systems. ANNs have various differences from biological brains. Specifically, neural networks tend to be static and symbolic, while the biological brain of most living organisms is dynamic (plastic) and analog.

"Deep learning is a particular kind of machine learning that achieves great power and flexibility by learning to represent the world as a nested hierarchy of concepts, with each concept defined in relation to simpler concepts, and more abstract representations computed in terms of less abstract ones."

CONCEPT OF FACE RECOGNITION

Facial recognition is a biometric software application capable of uniquely identifying or verifying a person by comparing and analyzing patterns based on the person's facial contours. Facial recognition is mostly used for security purposes, though there is increasing interest in other areas of use. In fact, facial recognition technology has

received significant attention as it has potential for a wide range of application related to law enforcement as well as other enterprises.
Facial recognition is also known as face recognition.

Pros:

- **Increased Security:** One of the biggest pros of facial recognition technology is that it enhances safety and security. From government agencies to personal use, there is an increasing demand for advanced security and surveillance systems. Organizations can easily identify and track anyone who comes onto the premises, and they can easily flag visitors who aren't welcome. It can be very helpful when it comes to finding potential terrorists. Plus, there is no key, badge, or password that can be stolen or lost.

- **Fast and Accurate:** With the ever-increasing demand for speed and the growing number of cyberattacks, having fast and accurate technology is key. Facial recognition technology provides verification that is convenient, quick, and accurate. Although possible, it is very difficult to fool facial recognition technology, which makes it beneficial in helping prevent fraud.

- **No Contact:** Facial recognition is preferred over fingerprint scanning because of its non-contact process. People don't have to worry about the potential drawbacks related to fingerprint identification technology, such as germs or smudges.

Cons:

- **High Implementation Costs:** Facial recognition requires top-quality cameras and advanced software to ensure accuracy and speed. However, Allied Market Research predicts that technological advancements are likely to reduce the prices of facial recognition systems in the future.

- **Data Storage:** The video and high-quality images required for facial recognition take up a significant amount of storage. In order for facial recognition systems to be effective, they only process about 10 to 25% of videos. This leads

organizations to use numerous computers to process everything and to do it quickly.

- **Changes in Appearance and Camera Angle:** Any major changes in appearance, including facial hair and weight changes, can throw off the technology. In these instances, a new picture is required. Camera angle can also cause issues because multiple angles are needed to identify a face.

Cyber Security

Computer security, cybersecurity or information technology security (IT security) is the protection of computer systems from the theft of or damage to their hardware, software, or electronic data, as well as from the disruption or misdirection of the services they provide.

The field is becoming more important due to increased reliance on computer systems, the Internet and wireless network standards such as Bluetooth and Wi-Fi, and due to the growth of "smart" devices, including smartphones, televisions, and the various devices that constitute the "Internet of things". Due to its complexity, both in terms of politics and technology, cybersecurity is also one of the major challenges in the contemporary world.

Employee behaviour can have a big impact on information security in organizations. Cultural concepts can help different segments of the organization work effectively or work against effectiveness towards information security within an organization. ″Exploring the Relationship between Organizational Culture and Information Security Culture″ provides the following definition of information security culture: ″ISC is the totality of patterns of behaviour in an organization that contribute to the protection of information of all kinds.″

Andersson and Reimers (2014) found that employees often do not see themselves as part of the organization Information Security "effort" and often take actions that ignore organizational Information Security best interests. Research shows Information security culture needs to be improved continuously. In ″Information Security Culture from Analysis to Change″, authors commented, ″It's a never ending process, a cycle of evaluation and change or maintenance.″ To manage the information security culture, five steps should be taken: Pre-evaluation, strategic planning, operative planning, implementation, and post-evaluation.

CONCEPT OF CYBER SECURITY

Cyber security or information technology security are the techniques of protecting computers, networks, programs and data from unauthorized access or attacks that are aimed for exploitation.

Major areas covered in cyber security are:

1) Application Security

2) Information Security

3) Disaster recovery

4) Network Security

Application security encompasses measures or counter-measures that are taken during the development life-cycle to protect applications from threats that can come through flaws in the application design, development, deployment, upgrade or maintenance. Some basic techniques used for application security are:

a) Input parameter validation

b) User/Role Authentication & Authorization

c) Session management, parameter manipulation & exception management

d) Auditing and logging.

Information security protects information from unauthorized access to avoid identity theft and to protect privacy. Major techniques used to cover this are:

a) Identification, authentication & authorization of user

b) Cryptography.

Disaster recovery planning is a process that includes performing risk assessment, establishing priorities, developing recovery strategies in case of a disaster. Any business should have a concrete plan for disaster recovery to resume normal business operations as quickly as possible after a disaster.

Network security includes activities to protect the usability, reliability, integrity and safety of the network. Effective network security targets a variety of threats and stops them from entering or spreading on the network. Network security components include:

a) Anti-virus and anti-spyware

b) Firewall, to block unauthorized access to your network,

c) Intrusion prevention systems (IPS), to identify fast-spreading threats, such as zero-day or zero-hour attacks

d) Virtual Private Networks (VPNs), to provide secure remote access.

Pros:

- **Protection against malware:** Protects system against viruses, worms, spyware and other unwanted programs.
- **Data Protection :** Protection against data from theft.
- **Exploit Protection :** Protects the computer from being hacked.
- **System crashes :** Minimizes computer freezing and crashes.
- **User Privacy :** Gives privacy to users so that they can trust the company about the secuirty of the data

Cons:

- **Configuartion Problem :** Firewalls can be difficult to configure correctly because they need very exact config. to work properly and secure the network.
- **User can face issue :** Incorrectly configured firewalls may block users from performing certain actions on the Internet, until the firewall configured correctly.
- **Speed :** Makes the system slower than before.
- **Update Issues :** Need to keep updating the new software in order to keep security up to date

Web Development

Web development is the work involved in developing a web site for the Internet (World Wide Web) or an intranet (a private network). Web development can range from developing a simple single static page of plain text to complex web-based internet applications (web apps), electronic businesses, and social network services. A more comprehensive list of tasks to which web development commonly refers, may include web engineering, web design, web content development, client liaison, client-side/server-side scripting, web server and network security configuration, and e-commerce development.

Among web professionals, "web development" usually refers to the main non-design aspects of building web sites: writing markup and coding. Web development may use content management systems (CMS) to make content changes easier and available with basic technical skills.

For larger organizations and businesses, web development teams can consist of hundreds of people (web developers) and follow standard methods like Agile methodologies while

developing websites. Smaller organizations may only require a single permanent or contracting developer, or secondary assignment to related job positions such as a graphic designer or information systems technician. Web development may be a collaborative effort between departments rather than the domain of a designated department. There are three kinds of web developer specialization: front-end developer, back-end developer, and full-stack developer. Front-end developers responsible for behaviour and visuals that run in the user browser, while back-end developers deal with the servers.

CONCEPT OF WEB DEVELOPMENT

In a nutshell, the web is a whole bunch of interconnected computers talking to one another. The computers (on the web) are typically connected by phone lines, digital satellite signals, cables, and other types of data-transfer mechanisms. A 'data-transfer mechanism' is a nerd's way of saying: a way to move information from point A to point B to point C and so on.

The computers that make up the web can be connected all the time (24/7), or they can be connected only periodically. The computers that are connected all the time are typically called a 'server'. Servers are computers just like the one you're using now to read this article, with one major difference, they have a special software installed called 'server' software.

Server software is created to 'serve' web pages and web sites. Basically, the server computer has a bunch of web sites loaded on it and it just waits for people (via web browsers) to request or ask for a particular page. When the browser requests a page the server sends it out.

The short answer is: by typing in the URL, or in other words, the web site address. So for example, if you wanted to find the web site www.abc.com, you would type in the address into your web browser's address bar or maybe use your 'favorites' or 'bookmarks' link to abc.

There are other ways to find web sites (like search engines,) but behind the scenes web sites are all being found by going to the web site's official address. That brings us our last nerd detail: how does a website get an official address so that the rest of the web can find it?

Like your home address is unique in the real world, there also can't be any duplicate addresses on the Internet, otherwise no one would know where to go! In other words, **domain names are unique addresses on the web**.

Pros:

- **The scope is great:** A career as a web developer will offer you stability and long-term visibility. As the internet becomes a larger community every day, the job market is expanding, creating new opportunities for developers. Since e-commerce is taking over the world, clients across all sectors are looking for web developers. The demand for web developers in the last decade has been sky-high with lucrative compensation.
- **Work-from-home is a real possibility:** This is the perfect career option for you as you don't need to necessarily work with a company. Several brands look to hire freelance developers and designers. You can work as a freelance web developer with a client-base of your own.
- **Endless opportunities to be creative:** As a web developer, you get to conceptualize and create websites from start to finish. You get to create something tangible that will have an impact on your users.

Cons:

- **The technology is always changing:** The computer information technology field is evolving on a daily basis. Because of this, several new methodologies, technologies, codes, and languages are getting introduced every day into the market. Web developers need to stay updated with the latest trends if they don't want their competition to get the better of them.
- **Dealing with naive clients:** Most web developers have to deal with clients who have absolutely no knowledge about how a website is created. Some don't even know the difference between a front-end and back-end developer. Because of this, they expect a back-end developer to do the job of a front-end developer and vice versa. But because they are clients, you cannot ignore their suggestions. When the client doesn ' t understand, sometimes it can get difficult to make a client understand that what they want for their website will actually be detrimental.
- **Long hours:** Just like with most professions, web developers work with tight deadlines too. If a project hasn't been completed by the date the client had

assigned, developers will need to work overtime to complete the website. Sometimes, if the client isn't satisfied, they might have to make the changes within the assigned deadline with no extension given. This can get stressful and can cut into your social life often.

Chapter 3 – Modules of the Project

HARDWARE SPECIFICATION FOR FACE RECOGNITION

1. **WebCam:** A webcam is a small digital video camera directly or indirectly connected to a computer or a computer network.
   Webcams come with software that needs to be installed on the computer to help users record video on or stream it from the Web. Webcams are capable of taking pictures as well as high-definition videos, although the video quality can be lower compared to other camera models.Webcams are also known as Web cameras.

2. **GPU:** A graphics processing unit (GPU) is a specialized electronic circuit designed to rapidly manipulate and alter memory to accelerate the creation of images in a frame buffer intended for output to a display device. GPUs are used in embedded systems, mobile phones, personal computers, workstations, and game consoles. Modern GPUs are very efficient at manipulating computer graphics and image processing. Their highly parallel structure makes them more efficient than general-purpose central processing units (CPUs) for algorithms that process large blocks of data in parallel. In a personal computer, a GPU can be present on a video card or embedded on the motherboard. If GPU requirements are not fulfilled then system can face bottleneck due to this whole system will freeze and face recognition software will not capture the images propelry.

3. **CPU:** A central processing unit (CPU), also called a central processor or main processor, is the electronic circuitry within a computer that carries out the instructions of a computer program by performing the basic arithmetic, logic, controlling, and input/output (I/O) operations specified by the instructions. The computer industry has used the term "central processing unit" at least since the early 1960s. Traditionally, the term "CPU" refers to a processor, more specifically to its processing unit and control unit (CU), distinguishing these core elements of a computer from external components such as main memory and I/O circuitry.

If the CPU doesn’t have the latest configuration then processing speed of image capturing and image recognition wil be very slow and the algorithm will not work in a efficient

4. **RAM:** RAM (Random Access Memory) is the hardware in a computing device where the operating system (OS), application programs and data in current use are kept so they can be quickly reached by the device's processor. RAM is the main memory in a computer, and it is much faster to read from and write to than other kinds of storage, such as a hard disk drive (HDD), solid-state drive (SSD) or optical drive.

SOFTWARE SPECIFICATION FOR FACE RECOGNITION

1. **Pycharm:** PyCharm is an integrated development environment (IDE) used in computer programming, specifically for the Python language. It is developed by the Czech company JetBrains.It provides code analysis, a graphical debugger, an integrated unit tester, integration with version control systems (VCSes), and supports web development with Django as well as Data Science with Anaconda.
   PyCharm is cross-platform, with Windows, macOS and Linux versions. The Community Edition is released under the Apache License, and there is also Professional Edition with extra features – released under a proprietary license.

2. **Database:** Database is a systematic collection of data. Databases support storage and manipulation of data. Databases make data management easy. Let's discuss few examples.
   Your electricity service provider is obviously using a database to manage billing , client related issues, to handle fault data, etc.
   Let's also consider the facebook. It needs to store, manipulate and present data related to members, their friends, member activities, messages, advertisements and lot more.
   We can provide countless number of examples for usage of databases .
   We are using Database to store the images of the use but in database we are also stroing the name associated with ever image so after face recognition it will tell

you the name of the user recognised by the software and will be displayed at the top right corner of the screen

3. **Files/Folder:** In computers, a folder is the virtual location for applications, documents, data or other sub-folders. Folders help in storing and organizing files and data in the computer. The term is most commonly used with graphical user interface operating systems. In folder with name “photo” We are saving the images captured by the webcam for backup purpose

SOFTWARE SPECIFICATION FOR ENCRYPTION-DECRYPTION

1. **Pycharm:** PyCharm is an integrated development environment (IDE) used in computer programming, specifically for the Python language. It is developed by the Czech company JetBrains. It provides code analysis, a graphical debugger, an integrated unit tester, integration with version control systems (VCSes), and supports web development with Django as well as Data Science with Anaconda.
   PyCharm is cross-platform, with Windows, macOS and Linux versions. The Community Edition is released under the Apache License, and there is also Professional Edition with extra features – released under a proprietary license.

2. **Files/Folder:** In computers, a folder is the virtual location for applications, documents, data or other sub-folders. Folders help in storing and organizing files and data in the computer. The term is most commonly used with graphical user interface operating systems. The main use of files in this software is to store the text that user has entered and the program has crashed so here we are using the files as a log file to capture the errors the software has encountered during its running.

3. **Executable Files:** An EXE file contains an executable program for Windows. EXE is short for "executable," and it is the standard file extension used by Windows programs. For many Windows users, EXE files are synonymous with Windows programs, making ".exe" one of the most recognizable file extensions.
   Now by using pyinstaller we convert the .py file to .exe file.

HARDWARE SPECIFICATION FOR WEB APP

1. **Server:** A server is a computer, a device or a program that is dedicated to managing network resources. Servers are often referred to as dedicated because they carry out hardly any other tasks apart from their server tasks.
   There are a number of categories of servers, including print servers, file servers, network servers and database servers.
   In theory, whenever computers share resources with client machines they are considered servers.

2. **Router:** A router is a physical or virtual appliance that passes information between two or more packet-switched computer networks -- analyzing a given data packet's destination IP address, calculating the best way for it to reach that destination and then forwarding it accordingly.
   A router is a common type of gateway -- positioned where two or more networks meet, including at each point of presence on the internet. Hundreds of routers might forward a single packet as it moves from one network to the next on the way to its final destination.

SOFTWARE SPECIFICATION FOR WEB APP

1. **Bootstrap:** Bootstrap is a free and open source front end development framework for the creation of websites and web apps. The Bootstrap framework is built on HTML, CSS, and JavaScript (JS) to facilitate the development of responsive, mobile-first sites and apps.
   Responsive design makes it possible for a web page or app to detect the visitor's screen size and orientation and automatically adapt the display accordingly; the mobile first approach assumes that smartphones, tablets and task-specific mobile

apps are employees' primary tools for getting work done and addresses the requirements of those technologies in design.

Bootstrap includes user interface components, layouts and JS tools along with the framework for implementation. The software is available precompiled or as source code.

2. **Phpstorm:** PhpStorm is a commercial, cross-platform IDE (integrated development environment) for PHP, built by the Czech Republic-based company JetBrains.

   PhpStorm provides an editor for PHP, HTML and JavaScript with on-the-fly code analysis, error prevention and automated refactorings for PHP and JavaScript code. PhpStorm's code completion supports PHP 5.3, 5.4, 5.5, 5.6, 7.0, 7.1, and 7.2 (modern and legacy projects), including generators, coroutines, the finally keyword, list in foreach, namespaces, closures, traits and short array syntax. It includes a full-fledged SQL editor with editable query results.

   PhpStorm is written in Java. Users can extend the IDE by installing plugins created for PhpStorm or write their own plugins. The software also communicates with external sources like XDebug.

   All features available in WebStorm are included in PhpStorm, which adds support for PHP and databases. WebStorm ships with pre-installed JavaScript plugins (such as for Node.js).

3. **Visual Studio Code:** Visual Studio Code combines the simplicity of a source code editor with powerful developer tooling, like IntelliSense code completion and debugging.

   First and foremost, it is an editor that gets out of your way. The delightfully frictionless edit-build-debug cycle means less time fiddling with your environment, and more time executing on your ideas.Edit, build, and debug with ease.

   At its heart, Visual Studio Code features a lightning fast source code editor, perfect for day-to-day use. With support for hundreds of languages, VS Code helps you be instantly productive with syntax highlighting, bracket-matching, auto-indentation, box-selection, snippets, and more. Intuitive keyboard shortcuts,

easy customization and community-contributed keyboard shortcut mappings let you navigate your code with ease.

For serious coding, you'll often benefit from tools with more code understanding than just blocks of text. Visual Studio Code includes built-in support for IntelliSense code completion, rich semantic code understanding and navigation, and code refactoring.

Chapter 4- Implementation Details

As mentioned in the previous chapters that I have worked on frontend, backend, Software development and database connectivity. So now I would be covering implementation details and my contribution in each field separately.

PROJECT ARCHITECTURE (FACE RECOGNITION)

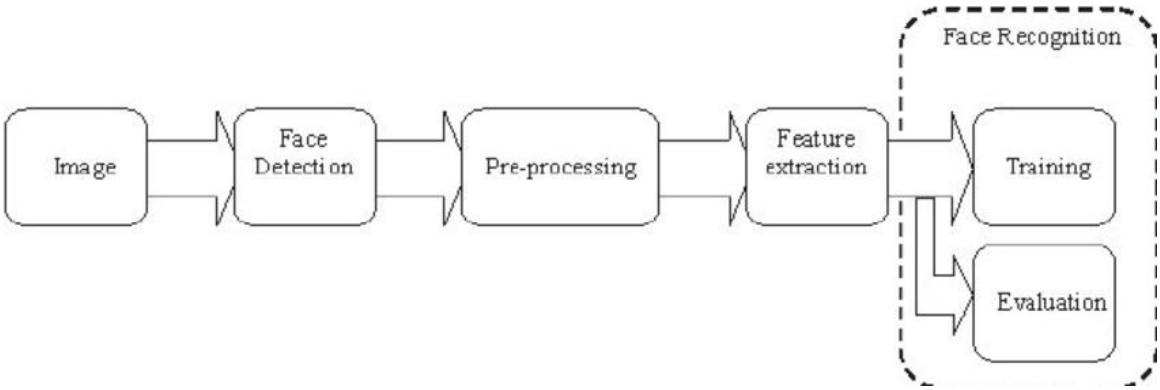


Figure 1.0

First of all we will capture the image of the user using webcam installed in the laptop/Desktop of the user .For proper and good working of the algo/code we will capture atleast 80-100 images of the user now after this we will detect the face using harcascade classifier available in .xml format then pre-processing, now we need to define some features in the code so that when an image is detected,the model will look for the defined features and will match them with the face.If everything goes well then face will be detected and will be highlighted in a rectangle with blue color.

Some more details:

I have implemented this project for our ACM DITU STUDENT CHAPTER for the purpose of attendance, In this we have captured the images of all the excecutives of our chapter and during a meeting we will open the software and plus point is only executives can open the app now the member will come and will speak a unique number (we have provided them) and the attendance will be marked.

Libraries:

1. **CV2:** OpenCV (Open Source Computer Vision Library) is an open source computer vision and machine learning software library. OpenCV was built to provide a common infrastructure for computer vision applications and to accelerate the use of machine perception in the commercial products. Being a BSD-licensed product, OpenCV makes it easy for businesses to utilize and modify the code.

2. **NumPy:** NumPy is the fundamental package for scientific computing with Python. It contains a powerful N-dimensional array object, sophisticated (broadcasting) functions, tools for integrating C/C++ and Fortran code,useful linear algebra, Fourier transform, and random number capabilities
   NumPy can be used as an efficient multi-dimensional container of generic data. Arbitrary data-types can be defined. This allows NumPy to seamlessly and speedily integrate with a wide variety of database

3. **OS:** The OS module in python provides functions for interacting with the operating system. OS, comes under Python's standard utility modules. This module provides a portable way of using operating system dependent functionality. The os and os.path modules include many functions to interact with the file system.

4. **Pyttsx3:** pyttsx is a cross-platform text to speech library which is platform independent. The major advantage of using this library for text-to-speech conversion is that it works offline.

5. **Shutil:** Shutil module in Python provides many functions of high-level operations on files and collections of files. It comes under Python's standard utility modules. This module helps in automating process of copying and removal of files and directories.

6. **Time:** Python has defined a module, "time" which allows us to handle various operations regarding time, its conversions and representations, which find its use

in various applications in life. The beginning of time is started measuring from 1 January, 12:00 am, 1970 and this very time is termed as “epoch” in Python.

7. **SMTPlib:** The smtplib module defines an SMTP client session object that can be used to send mail to any Internet machine with an SMTP or ESMTP listener daemon

Features :

1. We have implemented the face recognition in this project using the different module and features available in python
2. We have also implemented speech to text conversion using the google_audio module ,user just have to speek the id we have given to them,now this converted text will be stored in a variable for further proessing and that variable will be compared with every id stored in a text file and accordingly attendance will be marked.

PROJECT ARCHITECTURE (ENCRYPTION DECRYPTION)

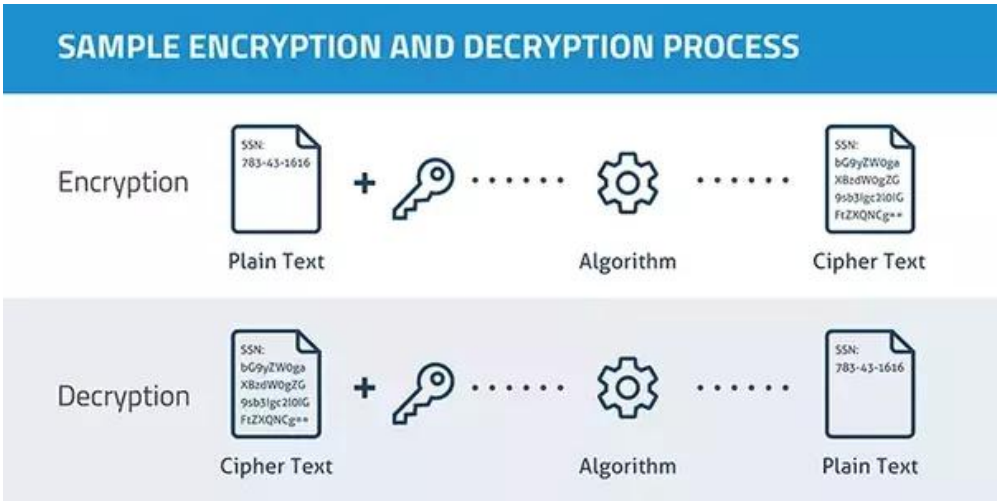


Figure 2.0

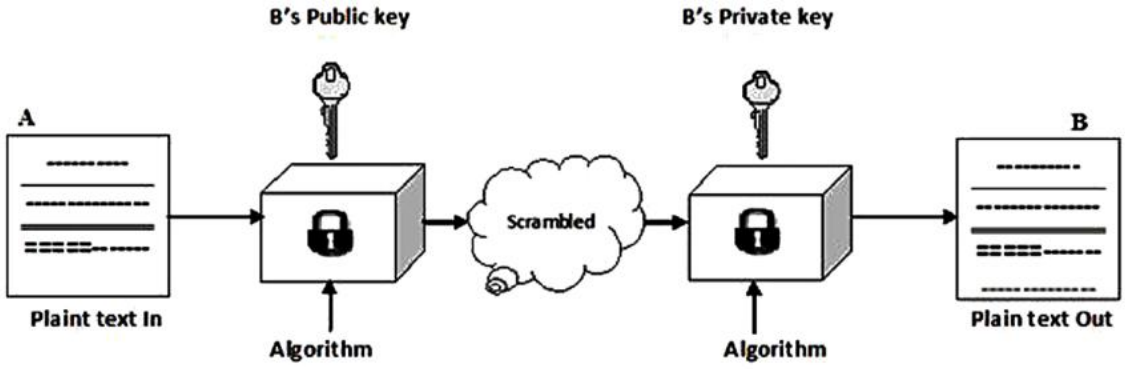


Figure 2.1

Encryption is the process of translating plain text data (plaintext) into something that appears to be random and meaningless (ciphertext). Decryption is the process of converting ciphertext back to plaintext.

To encrypt more than a small amount of data, symmetric encryption is used. A symmetric key is used during both the encryption and decryption processes. To decrypt a particular piece of ciphertext, the key that was used to encrypt the data must be used.

The goal of every encryption algorithm is to make it as difficult as possible to decrypt the generated ciphertext without using the key. If a really good encryption algorithm is used,

there is no technique significantly better than methodically trying every possible key. For such an algorithm, the longer the key, the more difficult it is to decrypt a piece of ciphertext without possessing the key.

In this project we have used following encryption-decryption methods:

1. Bash encryption/decryption
2. Rotation13 encryption/decryption
3. Rotation22 encryption/decryption
4. Simple encryption decryption
5. Ceaser keyed encryption decryption

Libraries:

1. **UUID:** UUID, Universal Unique Identifier, is a python library which helps in generating random objects of 128 bits as ids. It provides the uniqueness as it generates ids on the basis of time, Computer hardware (MAC etc.).

2. **Progress bar:** A text progress bar is typically used to display the progress of a long running operation, providing a visual cue that processing is underway.
   The ProgressBar class manages the current progress, and the format of the line is given by a number of widgets. A widget is an object that may display differently depending on the state of the progress bar.

3. **OS:** The OS module in python provides functions for interacting with the operating system. OS, comes under Python's standard utility modules. This module provides a portable way of using operating system dependent functionality. The os and os.path modules include many functions to interact with the file system.

4. **Logging:** Logging is a means of tracking events that happen when some software runs. Logging is important for software developing, debugging and running. If you don't have any logging record and your program crashes, there are very little chances that you detect the cause of the problem. And if you detect the cause, it

will consume a lot of time. With logging, you can leave a trail of breadcrumbs so that if something goes wrong, we can determine the cause of the problem.

Some more details

Whenever user try to run the software ,the user agent will prompt for the activation key of the software after entering the correct activation key the software will be ready to use ,this activation key 25 character long seperated by the symbol '-'.

PROJECT ARCHITECTURE (WEB APP)

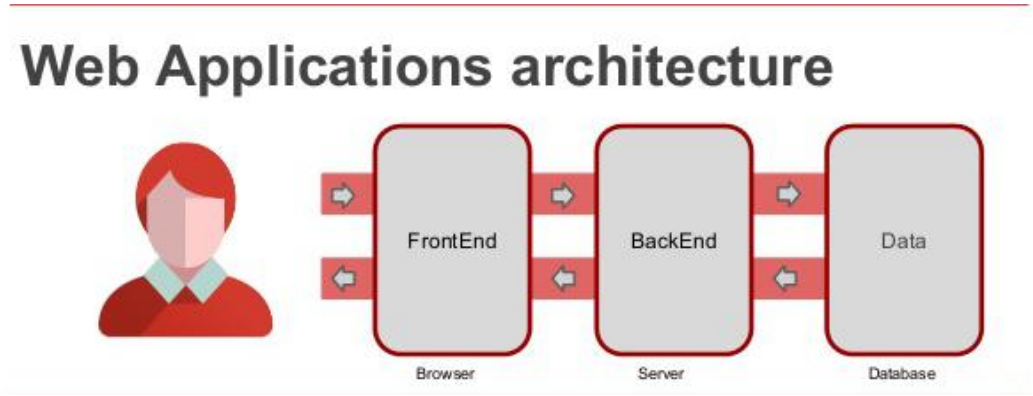


Figure 3.0

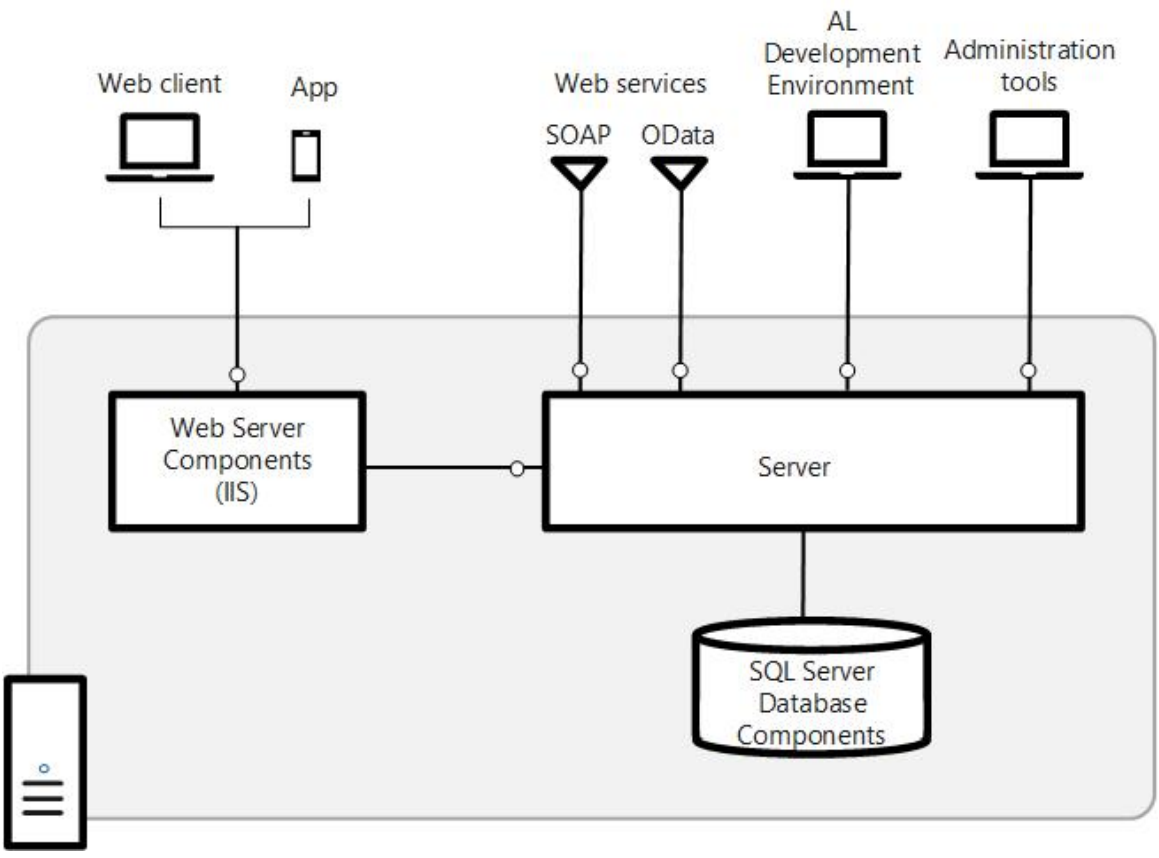


Figure 3.1

1. **Front End:** Front-end web development is the practice of converting data to a graphical interface, through the use of HTML, CSS, and JavaScript, so that users can view and interact with that data.

   Tools used for front-end development: There are several tools and platforms (wordpress, magento etc..) available that can be used to develop the front end of a website, and understanding which tools are best fit for specific tasks marks the difference between developing a hacked site and a well designed, scalable site.

2. **Hyper Text Markup Language (HTML):** Hyper Text Markup Language (HTML) is the backbone of any website development process, without which a web page doesn't exist. Hypertext means that text has links, termed hyperlinks, embedded in it. When a user clicks on a word or a phrase that has a hyperlink, it will bring another web-page. A markup language indicates text can be turned into images, tables, links, and other representations. It is the HTML code that provides an overall framework of how the site will look. HTML was developed by Tim Berners-Lee. The latest version of HTML is called HTML5 and was published on October 28, 2014 by the W3 recommendation. This version contains new and efficient ways of handling elements such as video and audio files.

3. **Cascading Style Sheets (CSS):** Cascading Style Sheets (CSS) controls the presentation aspect of the site and allows your site to have its own unique look. It does this by maintaining style sheets which sit on top of other style rules and are triggered based on other inputs, such as device screen size and resolution.

4. **Back End:** Back-end Development refers to the server-side development. It is the term used for the behind-the-scenes activities that happen when performing any action on a website. It can be logging in to your account or purchasing a watch from an online store.

   Backend developer focuses on databases, scripting, and the architecture of websites. Code written by back-end developers helps to communicate the database information to the browser.

   Most common example of Backend programming is when you are reading an article on the blog. The fonts, colors, designs, etc. constitute the frontend of this

page. While the content of the article is rendered from a server and fetched from a database. This is the backend part of the application.

5. **PHP:** The PHP Hypertext Preprocessor (PHP) is a programming language that allows web developers to create dynamic content that interacts with databases. PHP is basically used for developing web based software applications.

6. **phpMyAdmin:** phpMyAdmin is a free software tool written in PHP, intended to handle the administration of MySQL over the Web. phpMyAdmin supports a wide range of operations on MySQL and MariaDB. Frequently used operations (managing databases, tables, columns, relations, indexes, users, permissions, etc) can be performed via the user interface, while you still have the ability to directly execute any SQL statement.

Chapter 5 – Screenshots

SCREENSHOT OF FACE RECOGNITION PROJECT USING PYTHON

Main Code of the program to capture images and to train the model:

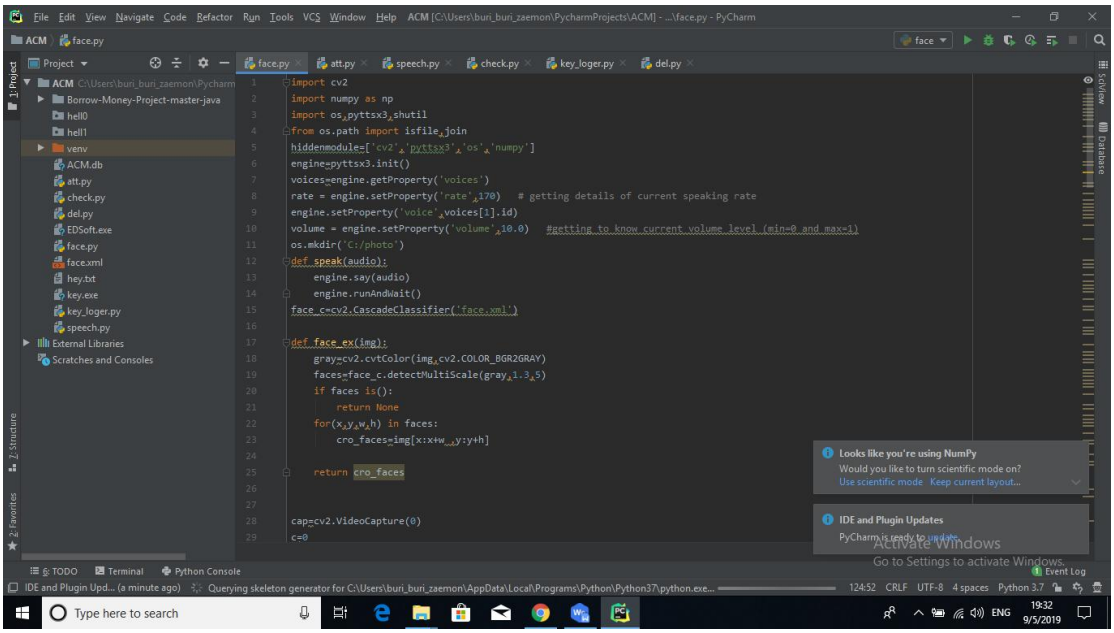


Figure 1.0 (Code)

Process of capturing images is atsrated using webcam:

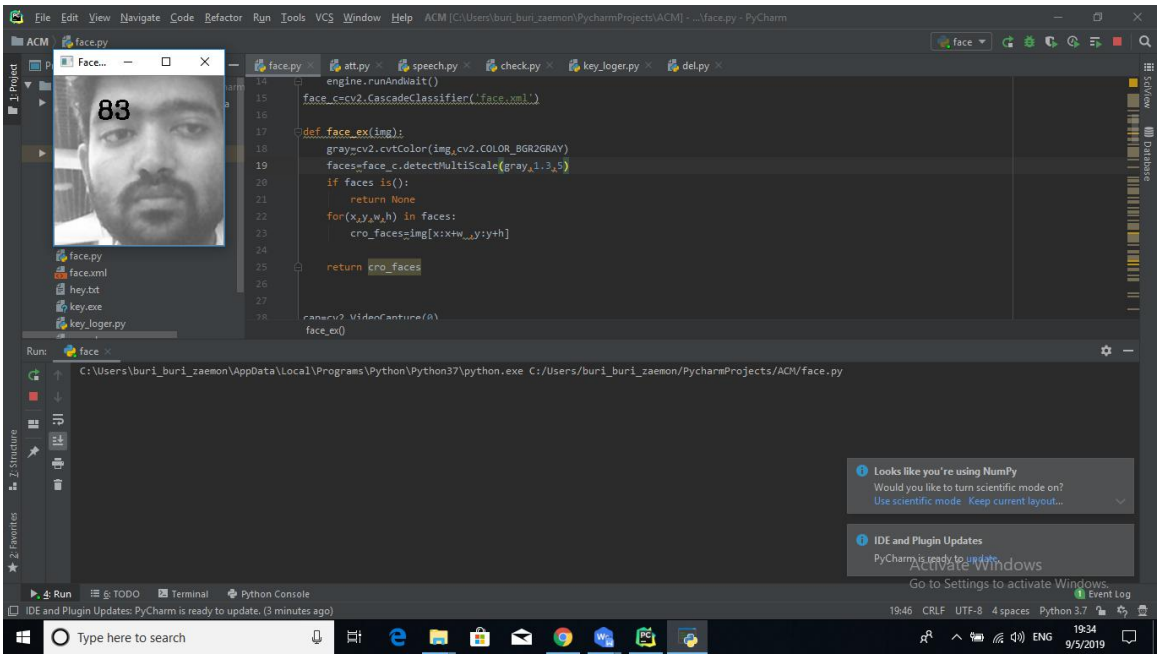
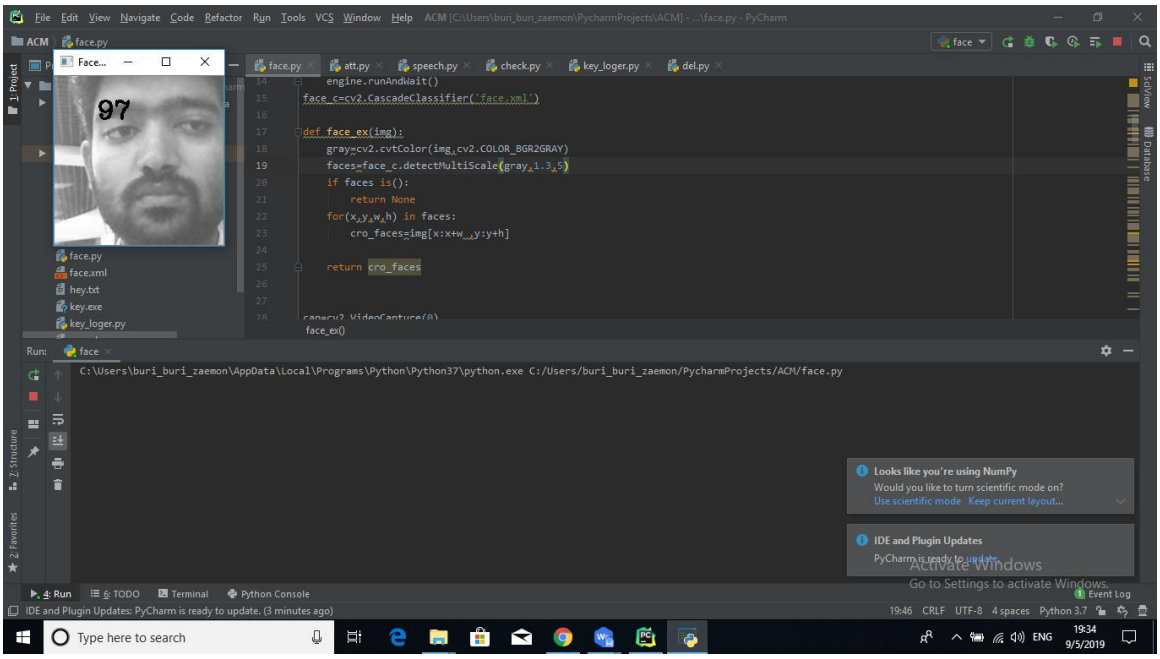


Figure 1.1(Capturing images)

100 images captured successfuly and saved in a directory in C:\photo:

Figure 1.2(Capturing images done)



Model has been trained successfuly and it is able to recognise my face with confidence level of 71%:

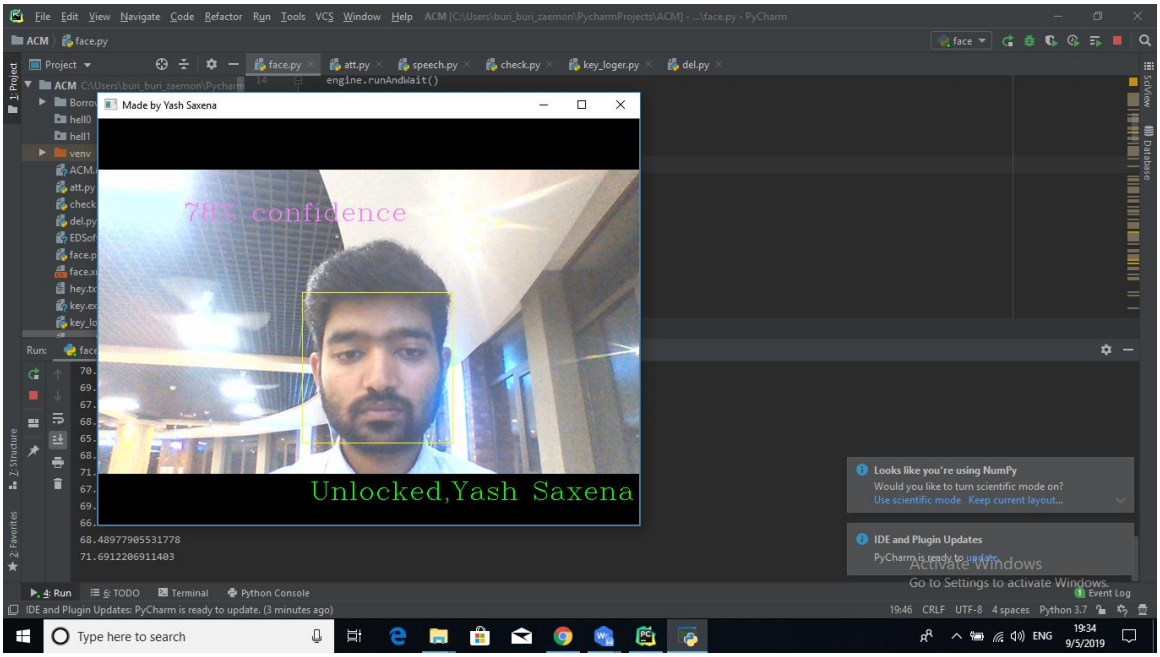


Figure 1.3(Face recognised successfuly)

Here Model was not able to verify my face because face angle is changed:

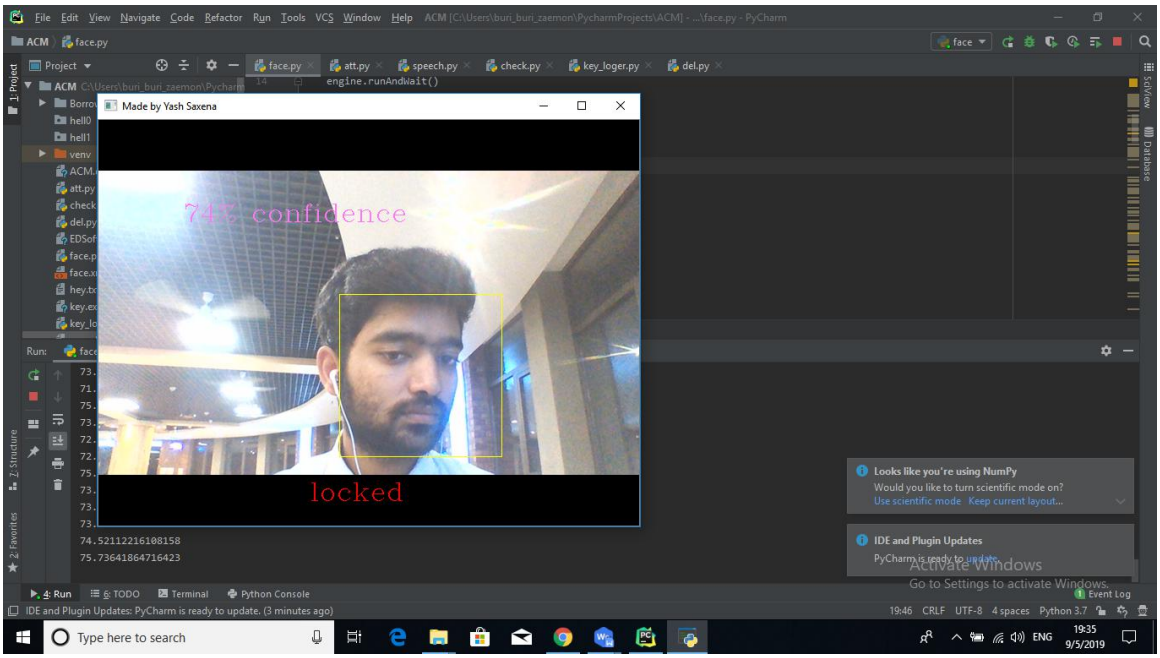


Figure 1.4(Can't recognise face)

SCREENSHOT OF ENCRYPTION DECRYPTION PROJECT USING PYTHON

Main code of the program to generate the activation key:

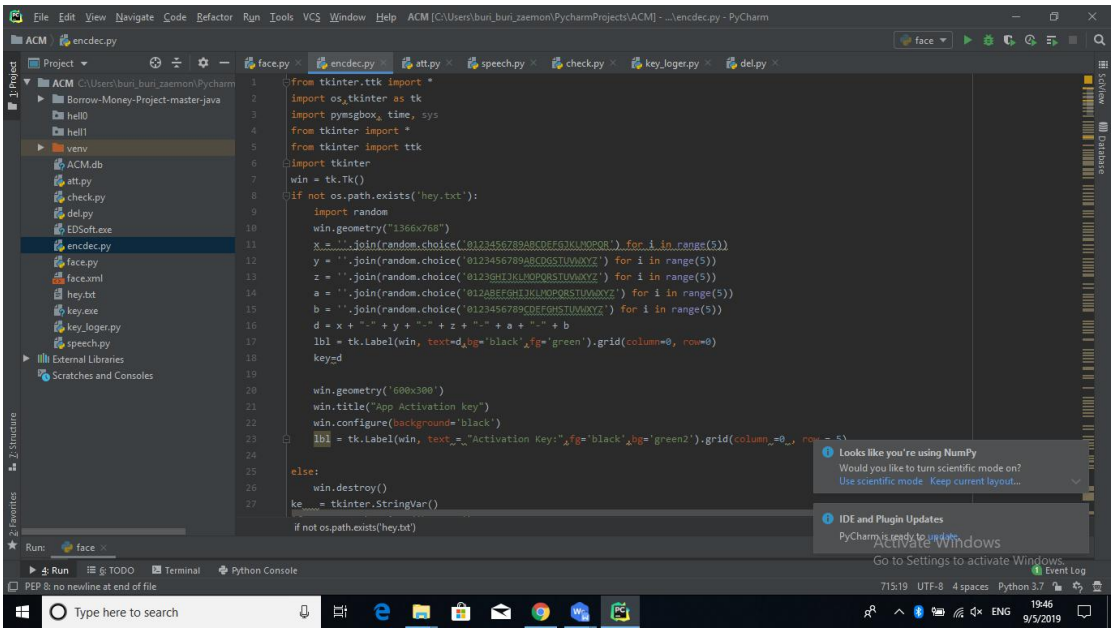


Fig 2.0(Code)

Another part of the program to perform encryption decryption:

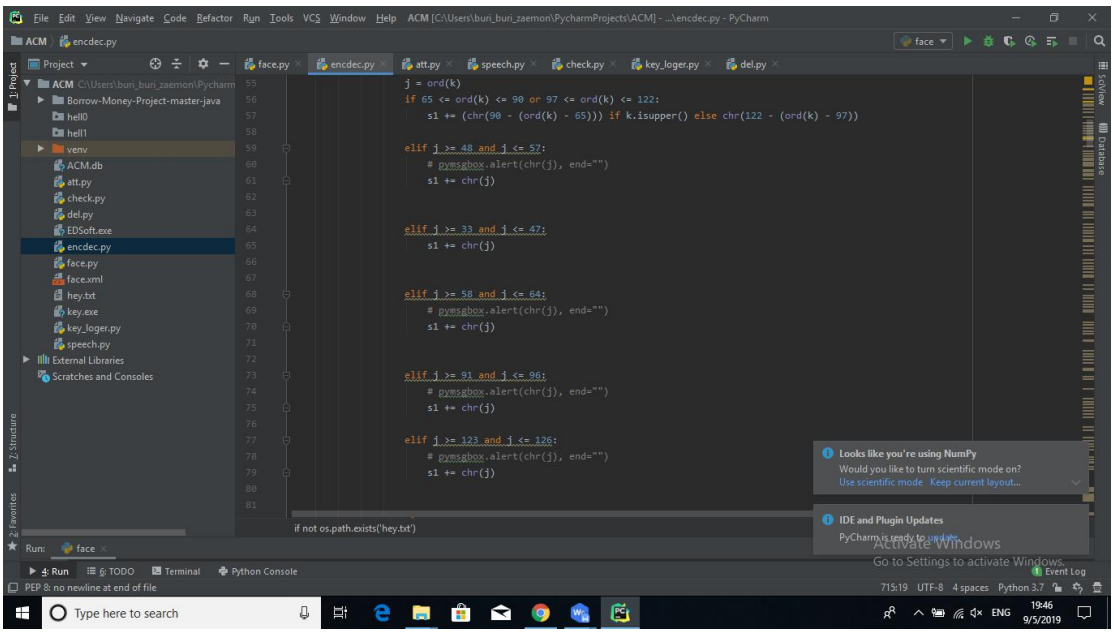


Fig 2.1(Code)

User interface to enter the activation key:

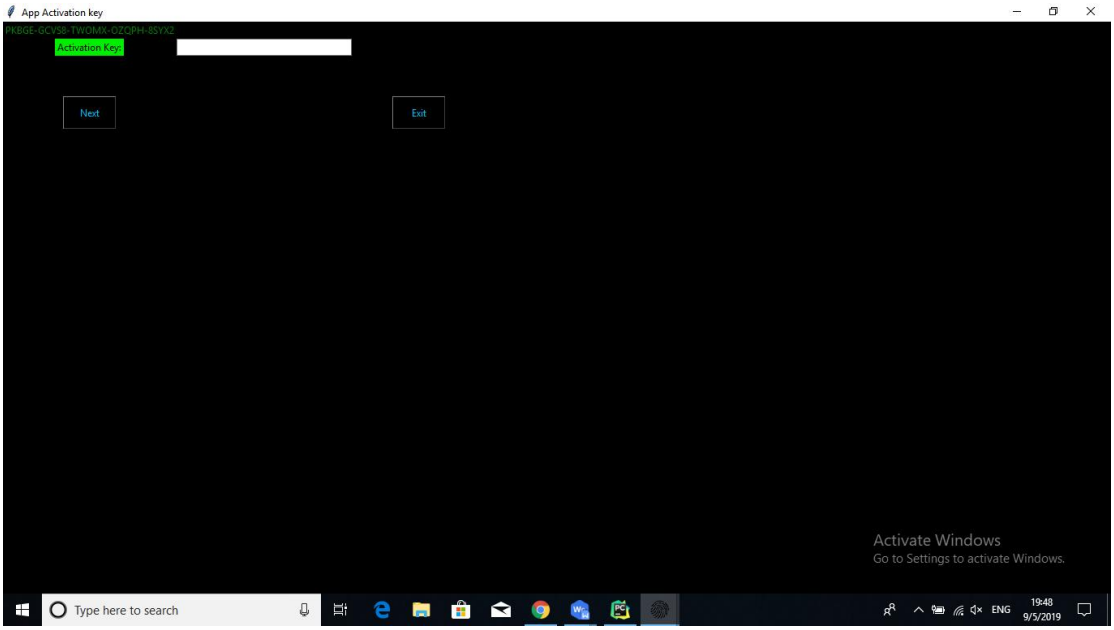


Fig 2.2 (Main interface)

Text box to enter the activation key so that user can verify the activation key:

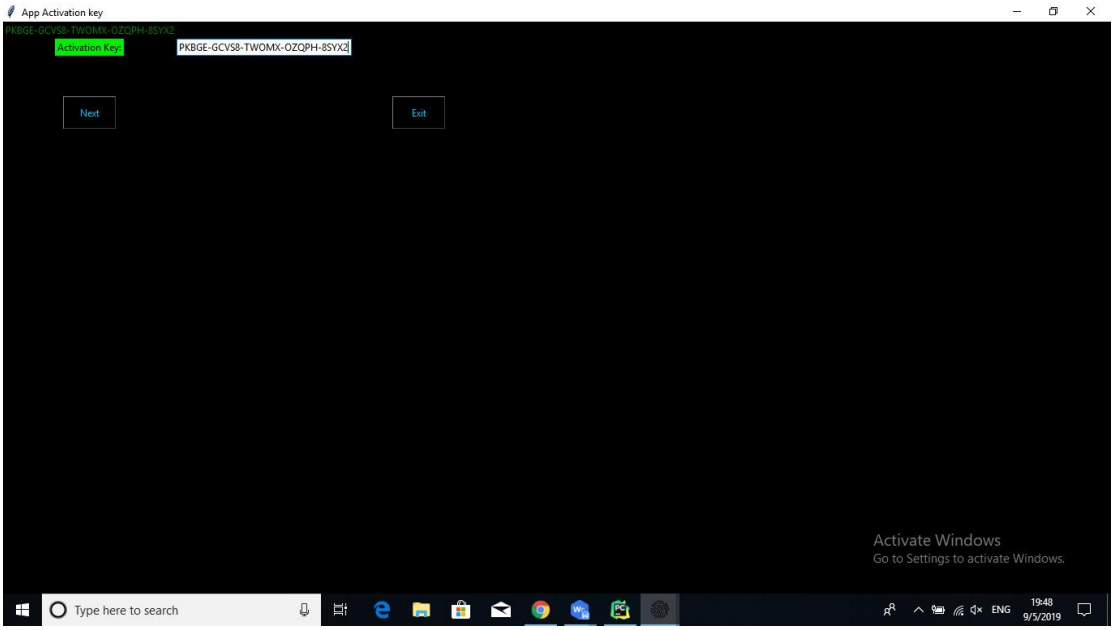


Fig 2.3 (Asking for the key)

Key has been verified succesfuly and a prompt message is there to confirm it:

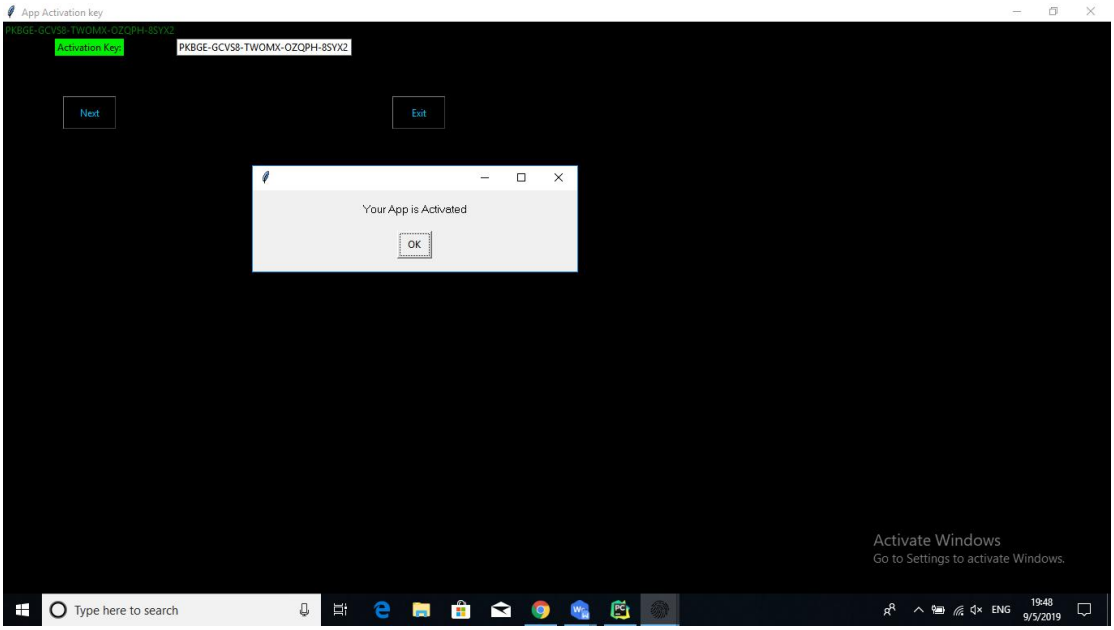


Fig 2.4 (Key entered successfuly)

Main interface of the software to select the method to encrypt or decrypt the data and a text box to input the string to encrypt:

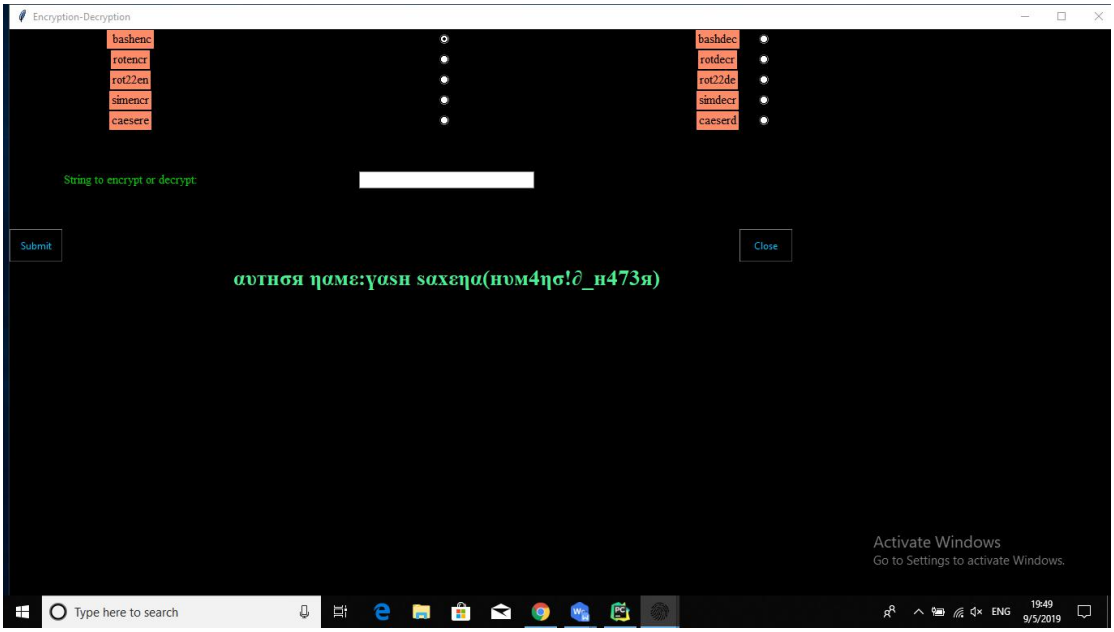


Fig 2.5 (Main GUI to perfrom Encryption decryption)

Message encrypted successfuly and results is displayed in form of a label:

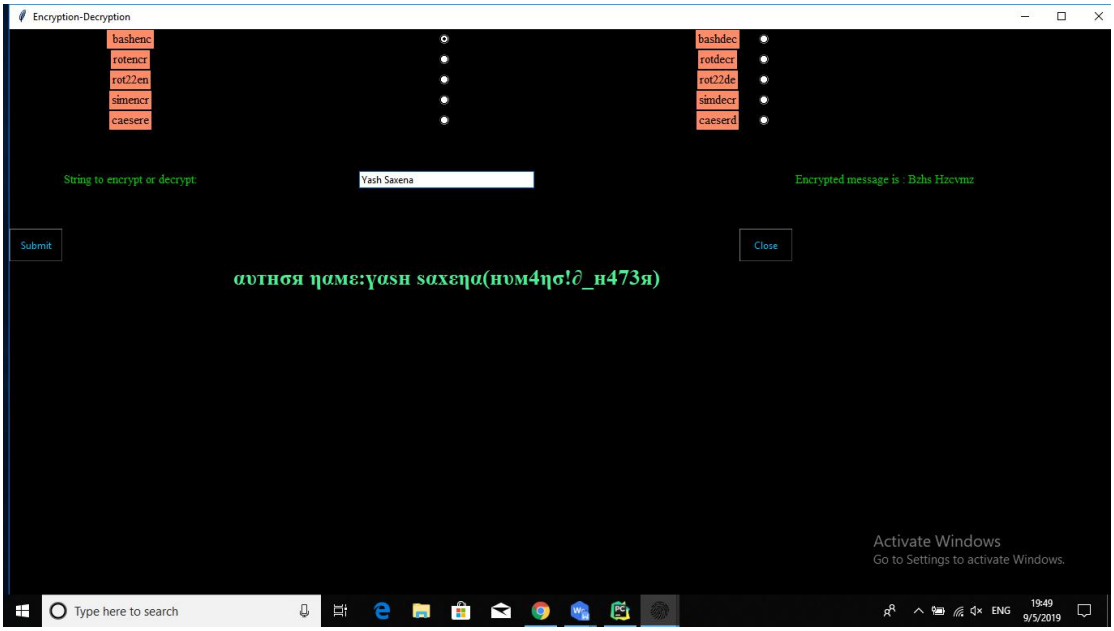


Fig 2.6(Encrypted message generated successfuly)

Message decrypted successfuly and results is displayed in form of a label:

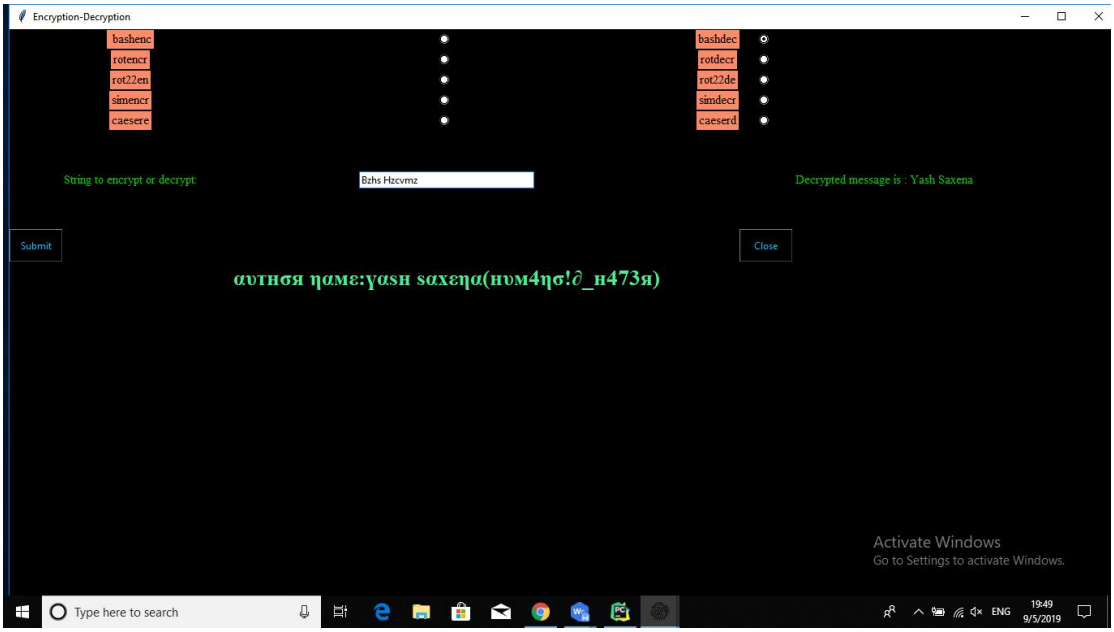


Fig 2.7(Decrypted message generated successfuly)

SCREENSHOT OF WEB APP

Students Panel:

Login Page takes Sap id and Password from User:

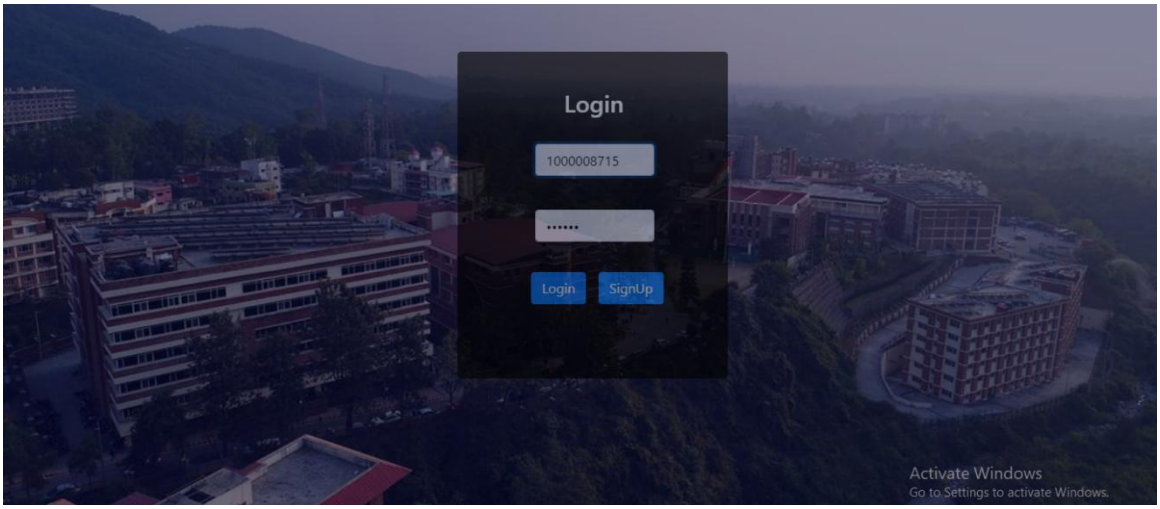


Fig 1.0 (Login Page)

Signup Page takes Sap id and Password from User:

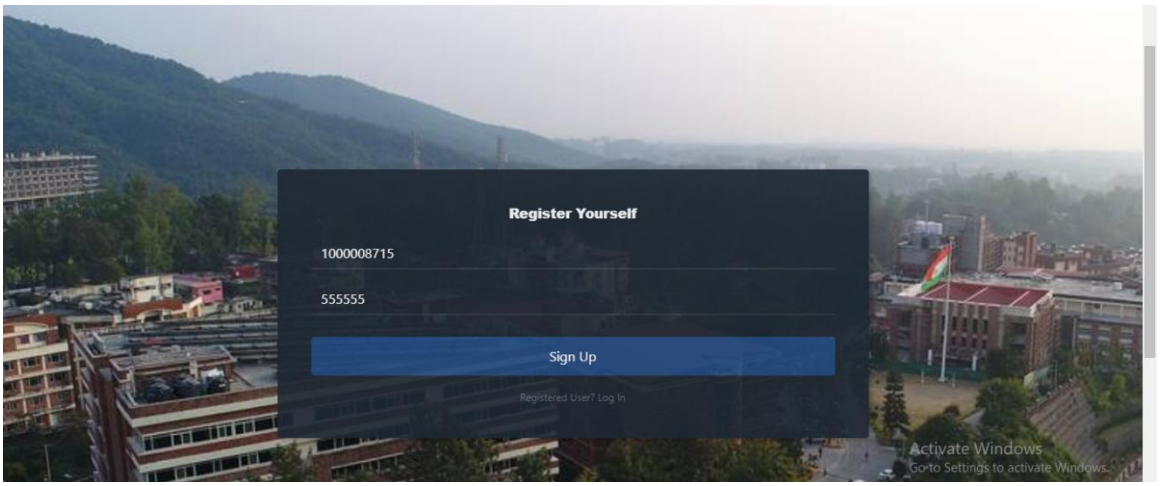


Fig 1.1 (Sign up Page)

Dashboard shows important details of the User:

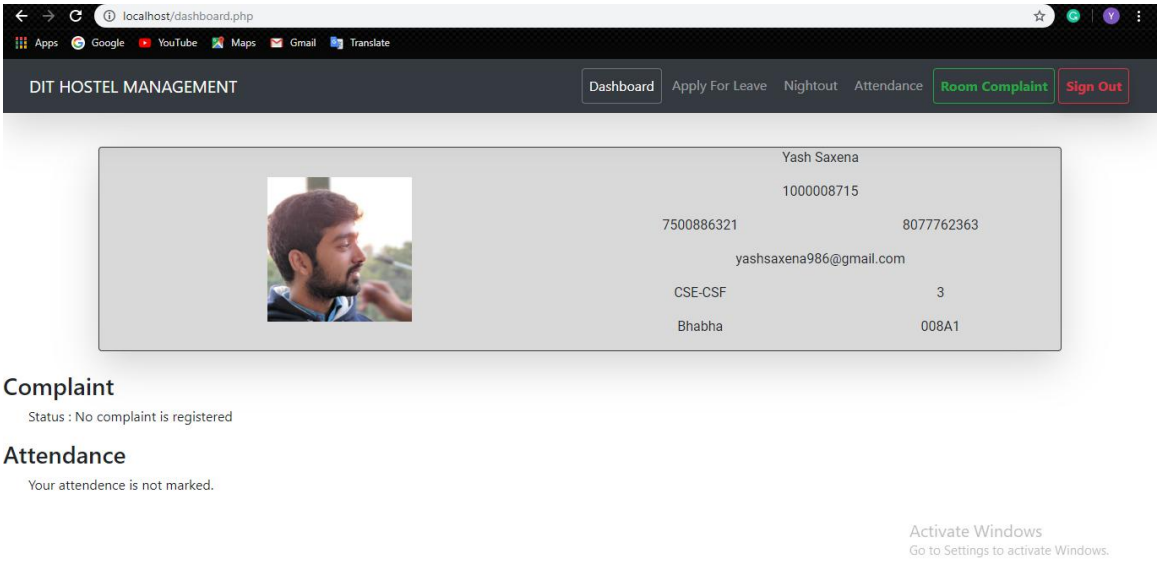


Fig 1.2 (Dashboard)

Leave page takes Place and time from

user:

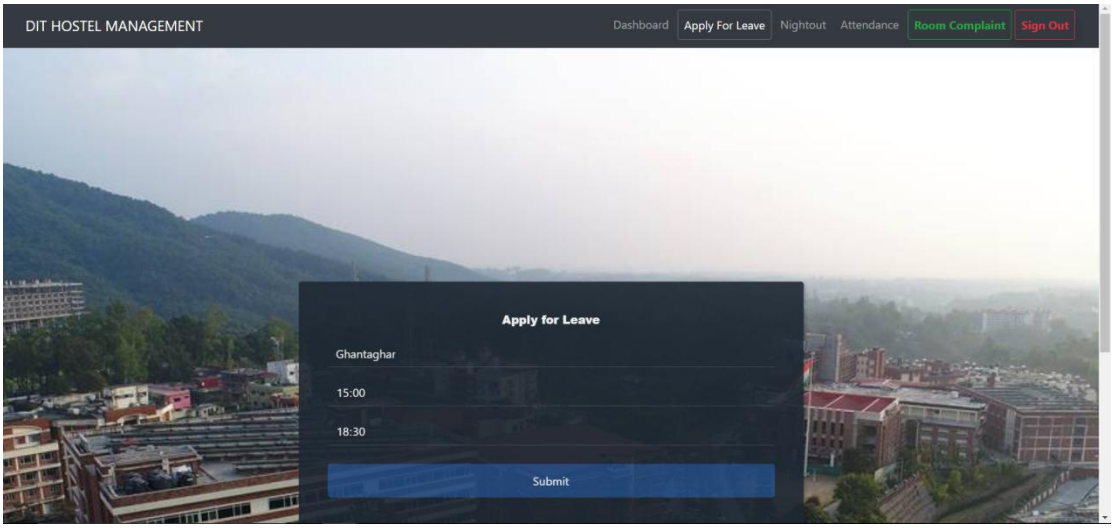


Fig 1.3 (Leave Page)

Apply for nightout page takes place and date from user:

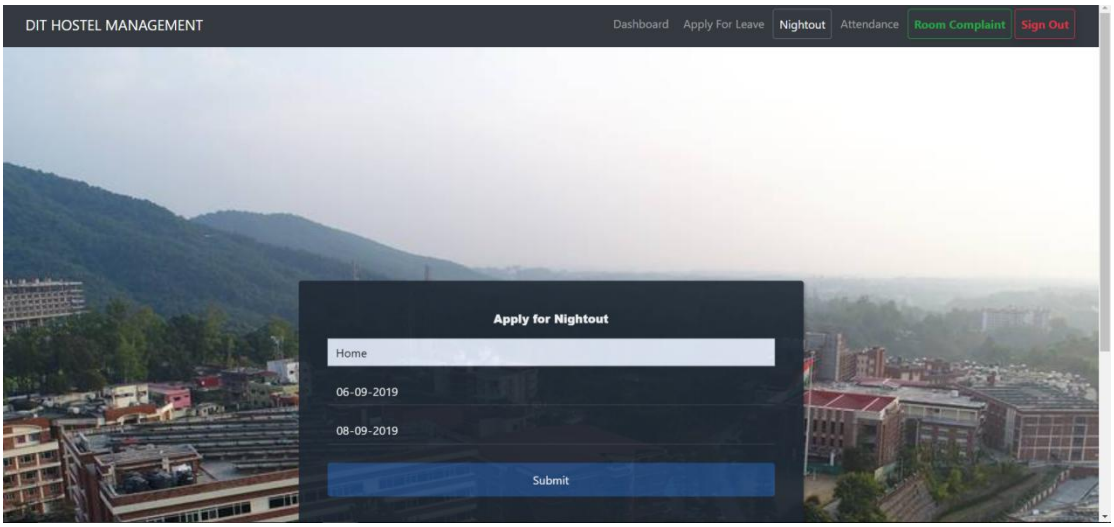


Fig 1.4 (Nightout page)

Attendance page takes TOTP from user through Google Authenticator App:

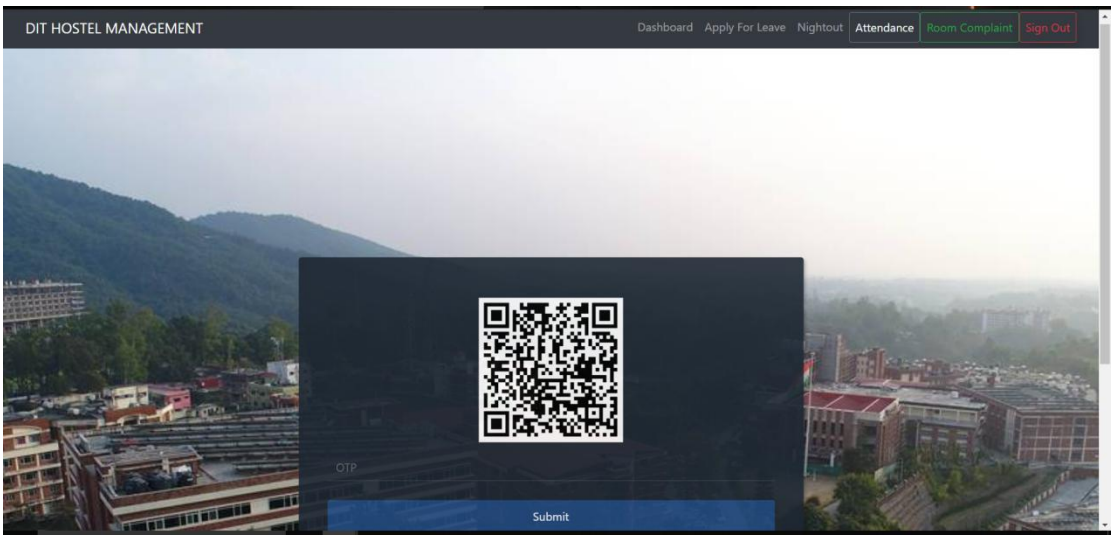


Fig 1.5 (Attendance Page)

Complaint page takes Hostel or Mess complaint from user:

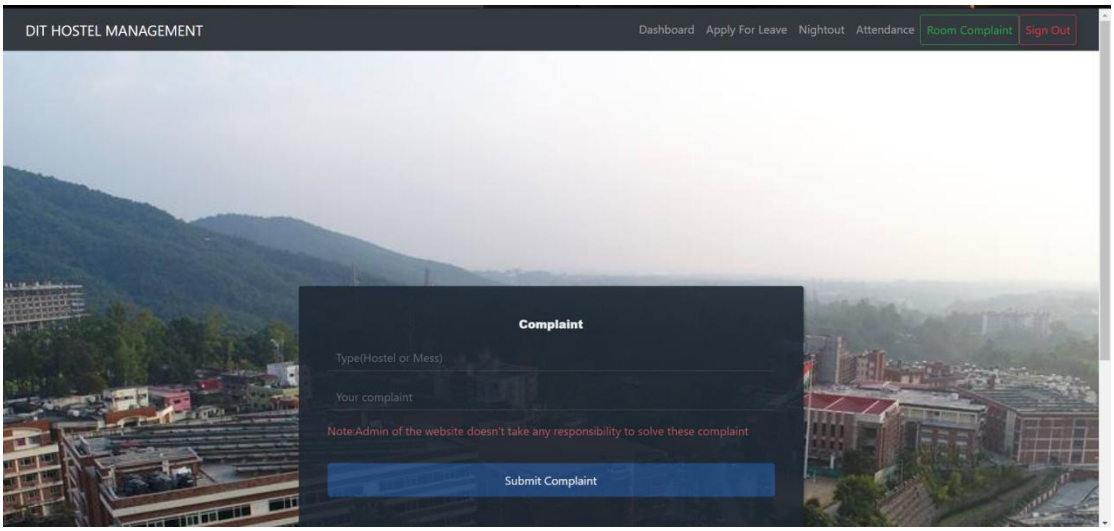


Fig 1.6 (Complaint Page)

Dashboard page updates the attendance and the details of Outpass or Nightout:

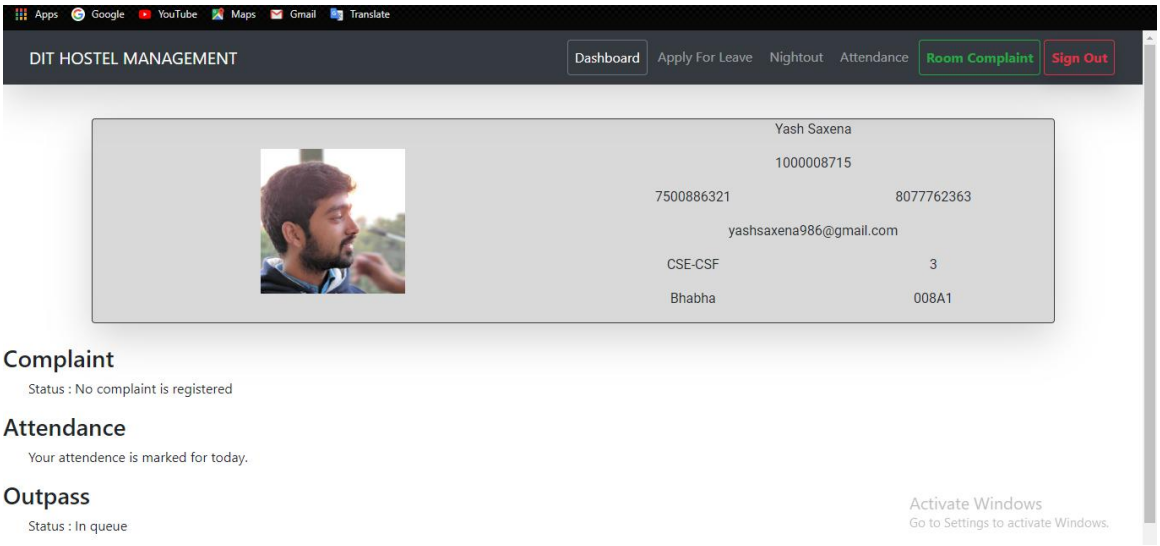


Fig 1.7 (Dashboard)

Wardens Panel:

Dashboard page of warden attendance of the students:

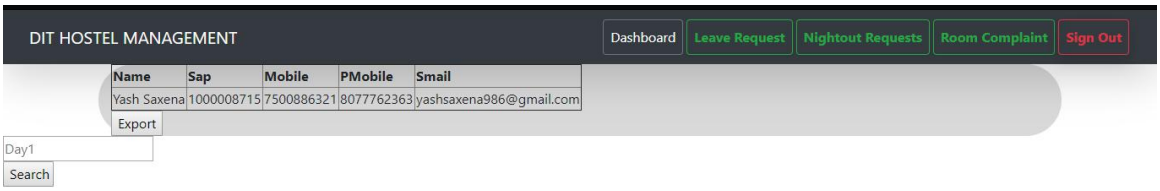


Fig 2.0 (Dashboard)

On this page warden can accept/decline leave application sent by student:

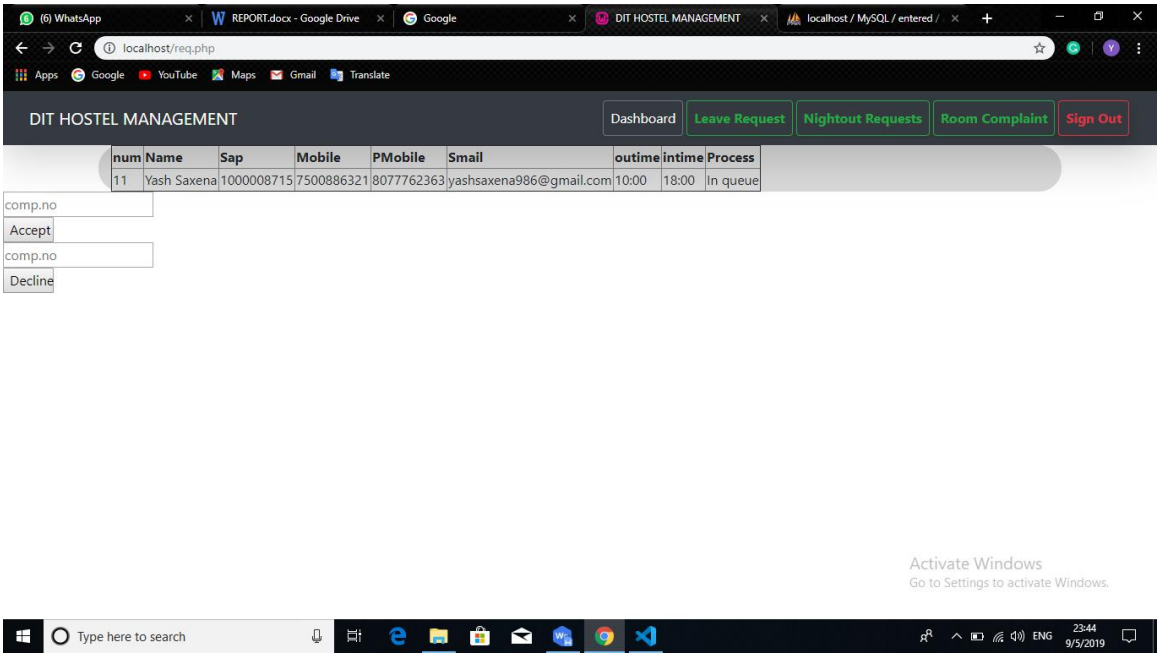


Fig 2.1 (Leave Request Page)

On this page warden can accept/decline nightout application sent by student:

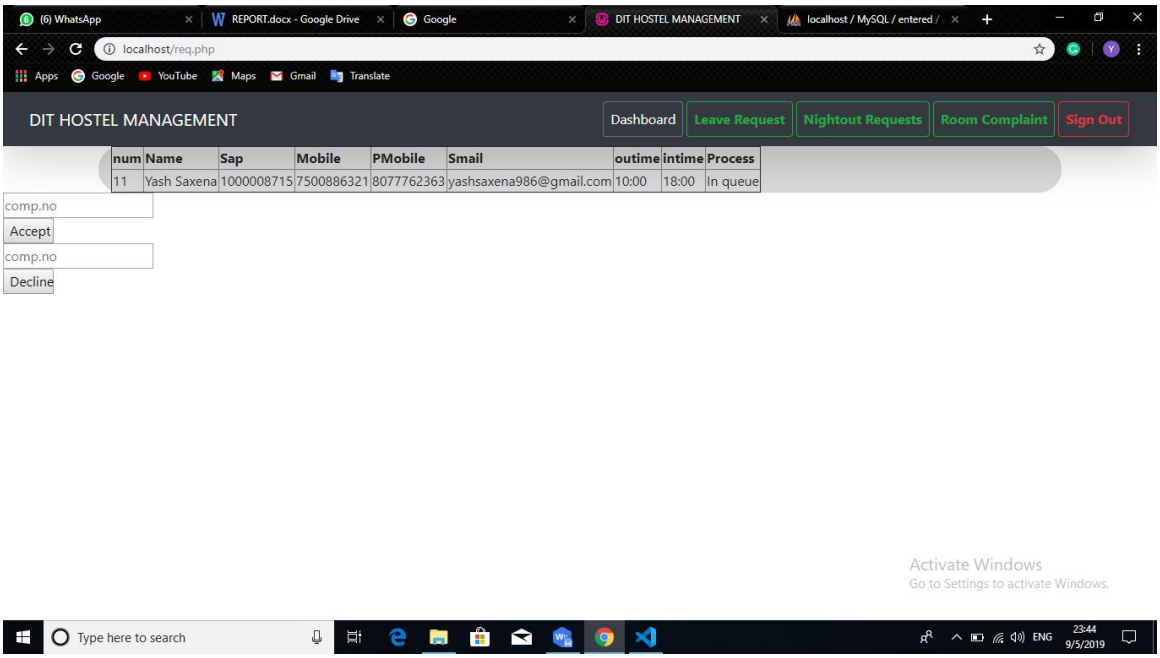


Fig 2.2 (Nightout Request Page)

This page can show the complaints sent by students, from here he can chose wether to accept or decline request:

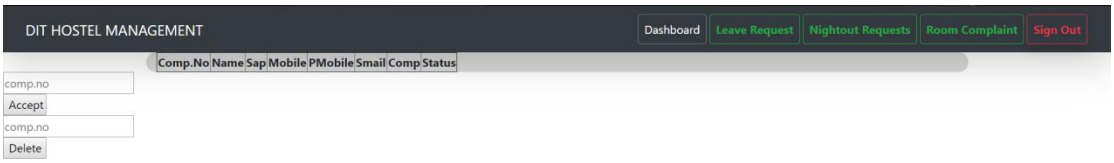
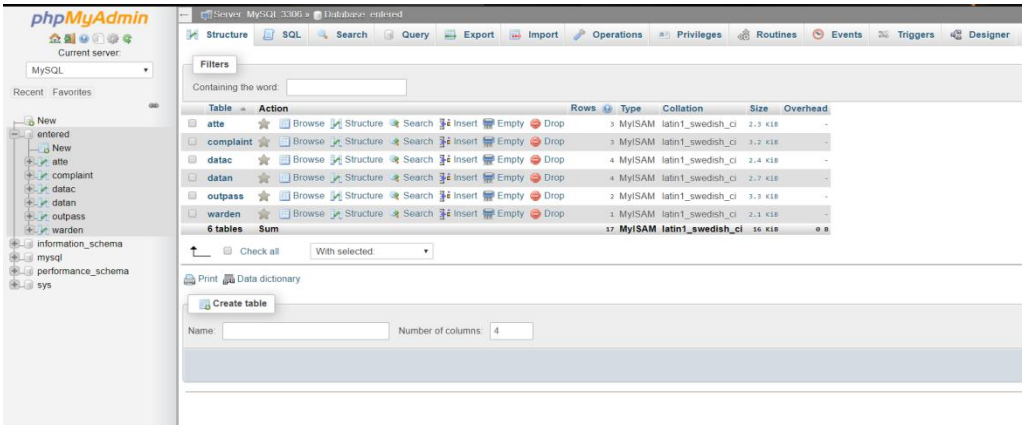


Fig 2.3 (Complaint Page)

phpMyadmin:

Backend Service for the website:


phpMyAdmin
Current server:
MySQL
Recent Favorites
New
entered
New
atte
complaint
datac
datan
outpass
warden
information_schema
mysql
performance_schema
sys
Server: MySQL:3306 » Database: entered
Structure SQL Search Query Export Import Operations Privileges Routines Events Triggers Designer
Filters
Containing the word:
Table Action Rows Type Collation Size Overhead
atte Browse Structure Search Insert Empty Drop 3 MyISAM latin1_swedish_ci 2.3 KiB -
complaint Browse Structure Search Insert Empty Drop 3 MyISAM latin1_swedish_ci 2.2 KiB -
datac Browse Structure Search Insert Empty Drop 4 MyISAM latin1_swedish_ci 2.4 KiB -
datan Browse Structure Search Insert Empty Drop 4 MyISAM latin1_swedish_ci 2.7 KiB -
outpass Browse Structure Search Insert Empty Drop 2 MyISAM latin1_swedish_ci 3.3 KiB -
warden Browse Structure Search Insert Empty Drop 1 MyISAM latin1_swedish_ci 2.1 KiB -
6 tables Sum 17 MyISAM latin1_swedish_ci 16 KiB 0 B
Check all With selected:
Print Data dictionary
Create table
Name: Number of columns: 4

Chapter 6 – Conclusion

The project has proposed the idea of developing different software for the ease of user to complete complex task in an easy and efficient manner. A software contains many feature like user input, user login, sending bug/reports to the developer so that developer can maintain and can update the software to rectify the problem faced by the user.

In this project, an efficient approach for making effective and attractive software is showcased with the help of different programming languages like python, mysql, database connectivity, php and bootstrap.

All the software are developed in such a manner that they can be run on any system but the condition is all the described hardware and software should be present in the system.

Chapter 7 – Future scope

There are a variety of enhancements that could be made to these projects to achieve greater level of security, usability and reliability.

1. We can increase the confidence level of the Face Recognition Software by using more classifiers such as eye, ear, hand, smile detection etc.
2. Extending the usage of Face Recognition Software by implementing it on hardware and using it in real life.
3. Adding more types of methods of encryption such as MD5, SHA256\512 hashing, also by using it in real life.
4. Improving the UX/UI of the website by adding animations and using materialistic design.
5. Improving the security of the page by using secure code and encryption techniques.

Bibliography

- Wikipedia
- Google Images
- Python: python.org
- Oreilly: oreilly.com
- Jetbrains: jetbrains.com
- Fingertec: fingertec.com
- phpMyAdmin: phpmyadmin.net
- Stackoverflow: stackoverflow.com