# MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

(A Govt. Aided UGC Autonomous & NAAC Accredited Institute Affiliated to RGPV, Bhopal)


**Project Report**

**on**

## DERMATOLOGIST ANALYSIS

**Submitted By:**

**NANSI GUPTA**

**0901CA201036**

**Mentor:**

**Mrs. Geeta Kakrani, Director, Kanishka I.T.**

**Dr. Anshu Chaturvedi, Professor, M.C.A**

## DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE

GWALIOR - 474005 (MP) est. 1957

MAY-JUNE 2022

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# DERMATOLOGIST ANALYSIS

A project report submitted in partial fulfilment of the requirement for the degree of

**MASTER OF COMPUTER APPLICATION**

in

**COMPUTER SCIENCE AND ENGINEERING**


Submitted by:

**NANSI GUPTA**

**(0901CA201036)**

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Submitted to:


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# KANISHKA Information Technology

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**WEBSITE & SOFTWARE TRAINING AND DEVELOPMENT**

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**TO WHOME SO EVER IT MAY CONCERN**

**Date**: 16-MAY-2022

This is to certify that Miss **NANSI GUPTA (0901CA201036)** Student of MCA from Madhav Institute of Technology and Science successfully completed four months (Jan 15,2022 to May 15,2022) long Training at this Organization.

During the period of her training program with us she had been exposed to different technologies like Python, HTML, CSS and JavaScript and make project on "DERMATOLOGIST ANALYSIS", during this period she was found punctual, hardworking and inquisitive.

We wish her every success in her life and career.

**Thank You in Anticipation**

With best wishes,

KANISHA I.T.PVT.LTD.,

Geeta Kakkadi

Director

Place: Gwalior

Date: May 16, 2022

**MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR**

(A Govt. Aided UGC Autonomous & NAAC Accredited Institute Affiliated to RGPV, Bhopal)

# CERTIFICATE

This is certified that **NANSI GUPTA (0901CA201036)** has submitted the project report titled **Dermatologist Analysis** under the mentorship of **Mrs. Geeta Kakrani, Director, Kanishka I.T.**, in partial fulfilment of the requirement for the award of degree of Master of Computer Application of Computer Science and Engineering from Madhav Institute of Technology and Science, Gwalior.

**Dr. Anshu Chaturvedi**
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Professor, M.C.A.
Department of CSE

**Dr. Manish Dixit**
Professor and Head,
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Dr. Manish Dixit
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**MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR**

(A Govt. Aided UGC Autonomous & NAAC Accredited Institute Affiliated to RGPV, Bhopal)

# DECLARATION

I hereby declare that the work being presented in this project report, for the partial fulfilment of requirement for the award of the degree of Master of Computer Application in Computer Science and Engineering at Madhav Institute of Technology & Science, Gwalior is an authenticated and original record of my work under the mentorship of **Mrs. Geeta Kakrani, Director, Kanishka I.T.**

I declare that I have not submitted the matter embodied in this report for the award of any degree or diploma anywhere else.

**NANSI GUPTA**
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2ND Year,
Master of Computer Application,
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**MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR**

(A Govt. Aided UGC Autonomous & NAAC Accredited Institute Affiliated to RGPV, Bhopal)

# ACKNOWLEDGEMENT

The full semester project has proved to be pivotal to my career. I am thankful to my institute, **Madhav Institute of Technology and Science** to allow me to continue my disciplinary project. I extend my gratitude to the Director of the institute, **Dr. R. K. Pandit** and Dean Academics, **Dr. Manjaree Pandit** for this.

I would sincerely like to thank my department, **Department of Computer Science and Engineering, for allowing** me to explore this project. I humbly thank **Dr. Manish Dixit**, Professor and Head, Department of Computer Science and Engineering, for his continued support during the course of this engagement, which eased the process and formalities involved.

I would like to express my gratitude to Kanishka I.T PVT.LTD for giving an opportunity to undertake this project in this esteemed organization and supporting me to complete this Internship project. I am very thankful to Geeta Kakrani Mam and all the colleague of Kanishka IT Pvt. Ltd. Gwalior for their valuable guidance, encouragement, inspiration and working devotion for the completion of the Internship project on "Dermatologist Analysis.

I am sincerely thankful to my faculty coordinator. I am grateful to the guidance of Dr.Anshu Chaturvedi (Project Coordinator), **Dr. R.S. Jadon**, (M.C.A., Program Coordinator),Prof.Parul Saxena (M.C.A, Professor), for their continued support and guidance throughout the project. I am also very thankful to the faculty and staff of the department.

**NANSI GUPTA**

0901CA201036

2ND Year,

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# ABSTRACT

The project “Dermatologist Analysis” will provide the information about the skin diseases or skin cancer. Skin cancer is of two type melanoma and non-melanoma. In India, the incidence of melanoma of the skin in the North region is 1.62 for males and 1.21 for females for every 1,00,000 people. The overall incidence of nonmelanoma skin cancer is the highest in the Northeast region, going as high as 5.14 for men and 3.98 for women for every 1,00,000 people. The purpose of this project is to come up with a solution to save millions of lives by early detection of skin cancer.

Melanoma occurs when the pigment-producing cells that give colour to the skin become cancerous. Symptoms might include a new, unusual growth or a change in an existing mole. Melanomas can occur anywhere on the body. Non-melanoma skin cancer refers to a group of cancers that slowly develop in the upper layers of the skin. The term non-melanoma distinguishes these more common types of skin cancer from the less common skin cancer known as melanoma, which can be more serious.

Convolutional Neural Network (CNN) are a class of deep neural networks, basically generalized version of multi-layer perceptron’s CNNs have given highest accuracy in visual imaging tasks. This project aims to develop a skin cancer detection CNN model which can classify the skin cancer types and help in early detection. The CNN classification model will be developed in Python using Kera’s and TensorFlow in the backend. The model will be tested and trained on the dataset collected from the International Skin Imaging Collaboration (ISIC) challenge archive.

This study presents the first systematic review of the state-of-the-art research on classifying skin lesions with CNNs. We limit our review to skin lesion classifiers. In particular, methods that apply a CNN only for segmentation or for the classification of dermoscopic patterns are not considered here. Furthermore, this study discusses why the comparability of the presented procedures is very difficult and which challenges must be addressed in the future.

State-of-the-art classifiers based on convolutional neural networks (CNNs) were shown to classify images of skin cancer on par with dermatologists and could enable lifesaving and fast diagnoses, even outside the hospital via installation of apps on mobile devices. To our knowledge, at present there is no review of the current work in this research area.

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# CHAPTER - 1

# 1 INTRODUCTION: -

## 1.1 ABOUT PROJECT-

The project is developed for those users who are suffering from some skin diseases to have a quick result. Dermatologist Analysis is a web portal or a mobile application that will make easy to detect cancerous cell more quickly, and efficiently. This has an easy working platform to find out the diseases while uploading a picture of the effective part. Dermatologist Analysis is only based on users. This system is focused on helping the users to cop up with the dangerous diseases.

This project is suitable for the user to save their time and money. This also help them to identify the diseases at the starting stage which will furtherly help them to get proper medication and proper treatment. This application can simply work more efficient and effective.

There are two modules in this system -Admin module and user module. In admin module the admin module contains the complete details about the user. Admin can manage information regarding the user sign up detail i.e., name, user name, email id, password, age, blood group, any other diseases. In user module -user can register on the web application. They can Upload the image of effective part and can get little information about diseases, also have a nearer dermatologist.

## SCOPE & OBJECTIVES –

The project scope defines the description of the work that is required in Dermatologist Analysis. In future our project is meant to satisfy the needs of patients who are suffering from skin diseases. Several user-friendly interfaces have also been updated.

This package shall prove to be a powerful in satisfying all the requirement of the user. It is the utmost faith that I present this software

to you hoping that will solve your problems and encourage you to continue appreciating technology because it is meant to change and ease all our work that seems to be very difficult. I don't mean that my project is the best or that I have used the best technology available it just a simple and a humble venture that is easy to understand. It gave a quite surety to the people about their diseases and will provide the positive result before visit to doctors. The cardinal objective of this project is to develop state of the art Convolutional Neural Network (CNN) model to perform the classification of skin lesion images into respective cancer types. The model is trained and tested on the dataset made Deep Learning Solutions for Skin Cancer Detection and Diagnosis 161 available by International Skin Imaging Collaboration

(ISIC). The model can be used for analyzing the lesion image and find out if it's dangerous at early stage.

## INFORMATION GATHERING TOOLS -

We get information about this project from several web sites, but for more important information for this project and to all fulfilled all the requirements we also discuss this project with others to know their opinion so that it can help others to cop up with the diseases.

## ADVANTAGES-

1. This project is very simple to operate therefore users can use this project without any problem.
2. The software can be access anytime anywhere which is available 24/7.
3. This project is very flexible it can be used by any users who are suffering from any skin diseases.
4. This project will provide quick and faster report to the user after analysis.
5. This project will provide user nearer dermatologist according to their skin diseases.

## 1.2 ABOUT ORGANIZATION: -

Kanishka IT Solutions Pvt. Ltd was incorporated in 2009 and is a complete IT solutions company. It is big corporate to small businesses and even entrepreneurial start-ups.

We have a team of technically capable and devoted people, state-of-the-art facilities and infrastructure to back up offshore development. We offer a virtual expansion of client's development environment and dependable services. Our highly qualified and experienced IT professionals give your business a global perspective as well as profitability by delivering turnkey IT solutions

The group's top-notch analysts, designers, application developers and support specialists strive to provide most effective solutions to the customers. Recognized as one of the top web designing and development companies of India, Kanishka IT Solutions has a business experience of 4 years and serves a diverse list of clients spread globally. As an integrated IT services providing firm we offer a cross-fertilization of strategic ideas in branding, websites & online marketing solutions.

COMPANY SERVICES -

- Web Site Development and designing
- Software Development & maintenance

COMPANY MISSION -

We believe in quality training to new comer generation in the field of Information & Technology. We provide technical skills to our student so that they can compete the world by their expertise.

Knowledge means the soundness in every aspect of technology, more emphasis is given on practical training on latest machines like laptops etc. we also provide theoretical training through projector slides and power point presentations to our students. We should try that our student gets complete knowledge according to corporate world of.

# 1.3 ABOUT TECHNOLOGIES: -

## SOFTWARE REQUIREMENTS –

Basic software requirements to Implement this Project –

### ➢ FRONTEND –

We use HTML-5 & CSS-3 and Java script for this project HTML -5 is the 5th version of HTML (Hyper Text Markup Language), Hypertext Markup Language (HTML) is the set of markup symbols or codes inserted into a file intended for display on the Internet. The markup tells web browsers how to display a web page's words and images.

Each individual piece markup code (which would fall between "<" and ">" characters) is referred to as an element, though many people also refer to it as a tag. Some elements come in pairs that indicate when some display effect is to begin and when it is to end.

**C**ascading **S**tyle **S**heets, fondly referred to as CSS, is a simple design language intended to simplify the process of making web pages presentable.CSS handles the look and feel part of a web page. Using CSS, you can control the color of the text, the style of fonts, the spacing between paragraphs, how columns are sized and laid out, what background images or colors are used, layout designs, variations in display for different devices and screen sizes as well as a variety of other effects.

Java script, often abbreviated JS, is a programming language that is one of the core technologies of the World Wide Web, alongside HTML and CSS. JavaScript is used to develop interactive web applications. JavaScript can power featured like interactive images, carousels, and forms. The language can be used with back-end frameworks like Node. is to power the mechanics behind a web page, such as form processing and payments

## ➢ BACKEND –

**For backend we decide to use Django which is python web framework**

**Python-**

Python is a general purpose, dynamic, high-level, and interpreted programming language. It

supports Object Oriented programming approach to develop applications. It is simple and easy to learn and supplies lots of high-level data structures. Python is easy to learn yet powerful and versatile scripting language, which makes it attractive for Application Development. Python's syntax and dynamic typing with its interpreted nature make it an ideal language for scripting and rapid application development. Python supports multiple programming pattern, including object-oriented, imperative, and functional or procedural programming styles. Python is not intended to work in a particular area,such as web programming. That is why it is known as multipurpose programming language because it can be used with web, enterprise, 3D CAD, etc. We do not need to use data types to declare variable because it is dynamically typed so we can write a=10 to assign an integer value in an integer variable.Python makes the development and debugging fast because there is no compilation step included in Python development, and edit-test-debug cycle is extremely fast.

**Django**

We use Django python 3.9 for backend, Django is a high-level Python Web framework that encourages rapid development and clean pragmatic design. A Web framework is a set of components that provide a standard way to develop websites fast and easily. Django's primary goal is to ease the creation of complex database-driven websites.

Django was designed to help developers take applications from concept to completion as quickly as possible. Django takes security seriously and helps developers avoid many common security mistakes. Some of the busiest sites on the web leverage Django's ability to quickly and flexibly scale.

## ➢ Database – SQLite 3

We use SQLite3 for database in this project A SQLITE3 file is a database file stored in the SQLite 3 format. It contains structured data records, which contain data types and values. SQLITE3 files are often used for storing embedded SQL-based databases for iPhone apps and other mobile applications. SQLite is a C library that provides a lightweight disk-based database that doesn't require a separate server process and allows accessing the database using a nonstandard variant of the SQL query language. Some applications can use SQLitee3 for internal data storage. It's also possible to prototype an application using SQLite and then port the code to a larger database such as PostgreSQL or Oracle. The sqlite3 module was written by Gerhard Haring. It provides an SQL interface compliant with the DB-API 2.0 specification described by PEP 249, and requires SQLite 3.7.15 or newer.

SQLite3 is a self-contained, file-based SQL database. SQLite comes bundled with Python and can be used in any of your Python applications without having to install any additional software. SQLite3 provides the different commands to the user such as the describe command, in which we can see the detailed structure of the table. SQLite3 database uses the. schema command to describe the table; the. schema is a command-line program and if we need to get a detailed structure of the table at that time, we need to follow some steps.

## BASIC SOFTWARE REQUIREMENTS TO RUN THIS PROJECT: -

- Any web browser.
- Any operating like Windows, Mac and android.
- Vs code
- Django python 3.9

## HARDWARE REQUIREMENT: -

Basic hardware requirements to Implement this Project –

- Disk Space: 500GB+
- Database: SQLite3
- RAM: 2GB+
- Processor – Intel i3 core (Minimum)
- Processor Speed – 2.5

# CHAPTER – 2

# 2 SYSTEM ANALYSIS: -

It is a process of collecting and interpreting facts ,identifying the problems ,and decomposition of a system into its components.

## 2.1 REQUIREMENT IDENTIFICATION: -

### 2.1.1 STUDY OF EXISTING SYSTEM

Initially, we collected all the information and the working of the current system. We noted the limitation of that system, which motivated us to develop new system. With the help of these information, we got basic ideas about the existing system. we tried to implement those ideas to develop the proposed system.

The most important thing is to study system thoroughly. Here we are studying both existing system and proposed system so that advantages & disadvantages of both the systems can be understood.

### 2.1.2 PROBLEMS AND WEAKNESS OF EXISTING SYSTEM-

In existing system user have a lot of problem to face and even some time they also feel shame because of their diseases. Due to that some of them don't even visit to dermatologist for checkup which causes them a serious problem and they don't even know about the category of problem they are facing. They don't have any kind of information about the diseases they don't even know the things they have to consume at that period. That will be the waste of time and even the waste of money. Don't have the quick result. Have to find the nearer dermatologist. Users have insecurity issue they don't want others to know about the diseases. Previous system can also have the hygiene problem as the pandemic time

is going, they can also have the problem of social distancing in the hospitals even the machines for checking the diseases can also get affect, which can get the serious problem for the user.

### 2.1.3 PROPOSED SYSTEM: -

User will firstly visit to the website and will sign up and create account by putting their little information. They can visit to our whole website and can read information about us, as well as about the skin diseases. They can put the image of disease which help them to know the name of the diseases, can easily find about the diseases on the provided feature, they can also find the dermatologist nearer by them.

## 2.2 FEASIBILITY STUDY: -

Preliminary investigation examines project feasibility, the likelihood the system will be useful to the organization. The main objective of the feasibility study is to test the Technical, Operational and Economical feasibility for adding new modules and debugging old running system. All system is feasible if they are unlimited resources and infinite time.

The following feasibility study was undertaken for the proposed system

### 2.2.1 TECHNICAL FEASIBILITY: -

The technical issue usually raised during the feasibility stage of the investigation includes the following:

1) Does the necessary technology exist to do what is suggested?
   - ❖ Yes, there are many technologies available to do but Django is one of most popular one.
2) Will the proposed system provide adequate response to inquiries, regardless of the number or Location of users?
   - ❖ Yes, it is very efficient, it can handle large number of inquiries at the same time.

3) Can the system be upgraded if developed?
   - ❖ . Yes, it can be upgrades as the new features comes it can be replaced the older one.

4) Are there technical guarantees of accuracy, reliability, ease of access and data security?
   - ❖ . Yes, it is very accurate and reliable as it has wide community of users and is highly accessible and secure

### 2.2.2 **ECONOMIC FEASIBILITY: -**

The system is financially feasible. It does not require any addition hardware or software. Since the interface for this system is developed using the existing resources and technologies, there is nominal expenditure and economic feasibility for certain. There have some aspects which is define why this project is economically feasible.

1) This is very important aspect to be considered while developing a project. We decided the technology based on minimum possible cost factor.

2) Overall, we have estimated that, the benefits to the organization are going to receive from the proposed system, will surely overcome the initial costs and the later on running cost for system. So, this project is economic feasible.

### **2.2.3 BEHAVIORAL FEASIBILITY:** -

Behavior feasibility is a term used to describe people's attitudes towards different things. It also studies how people react to things. If the system meets the requirements of the customers and the administrator, we can say that the system is operationally feasible. The proposed system will be beneficial only if it can be turned into a system which will meet the requirements of the project when it is developed and installed, and there is sufficient support from the users.

The proposed projects will be beneficial for the user then only. When they will test the operational feasibility of the project, to implement this system, then some important issue may arise, includes the following:

- **Is there sufficient support from their management team for the users?**

Ans.- Yes, there have sufficient support from the management team for the client. We are providing some services to the user which will be beneficial for the client and it will attract the client. Some services will be like this: we will be providing technical and maintenance support till the 1 year, where we will help during this period if client face problems or bugs in the project. We will provide free hosting and domain to the user, with which they will be able to implement the project without any extra cost.

- **Will the system be beneficial, if it will be developed and implemented?**

Ans- If client implement this project in future, so it is beneficial for the client's business purpose, because most of the users wants all facilities in single platform, like: to get information about the diseases earlier. This web-portal will meet all these user's requirements in one platform, which will attract more users and this will directly help to capture the user suffering from the various skin diseases.

Following tasks are performed by the operational feasibility for users:

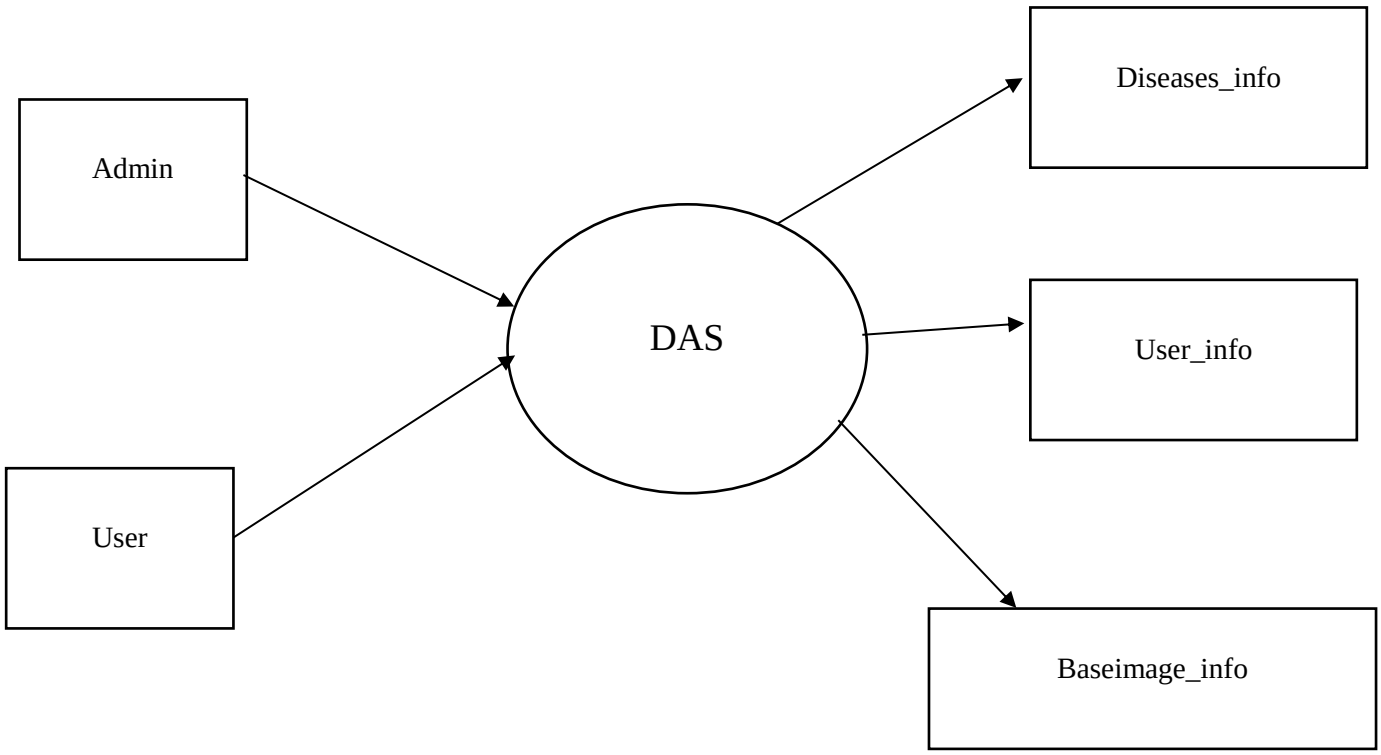
It checks that the project is user friendly or not.

- Its interface should be simple so that everyone should be able to use it.
- The proposed system will improve the total performance. The proposed system will be available to the customers throughout the globe.The proposed system will provide a better market for different users.

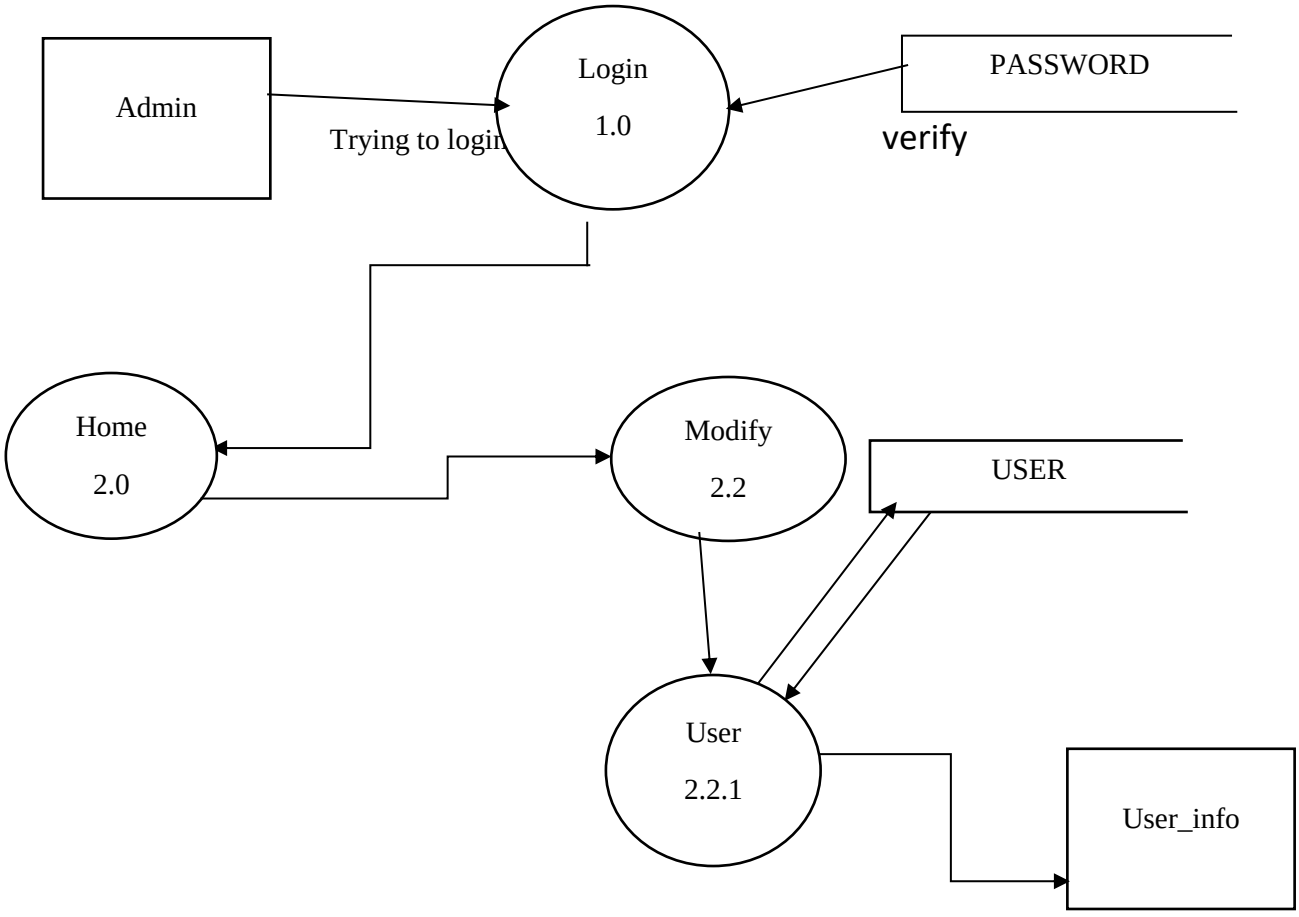
## 2.3 DATA FLOW DIAGRAM: -

A data flow diagram is a graphical view of how data is processed in a system in terms of input and output.

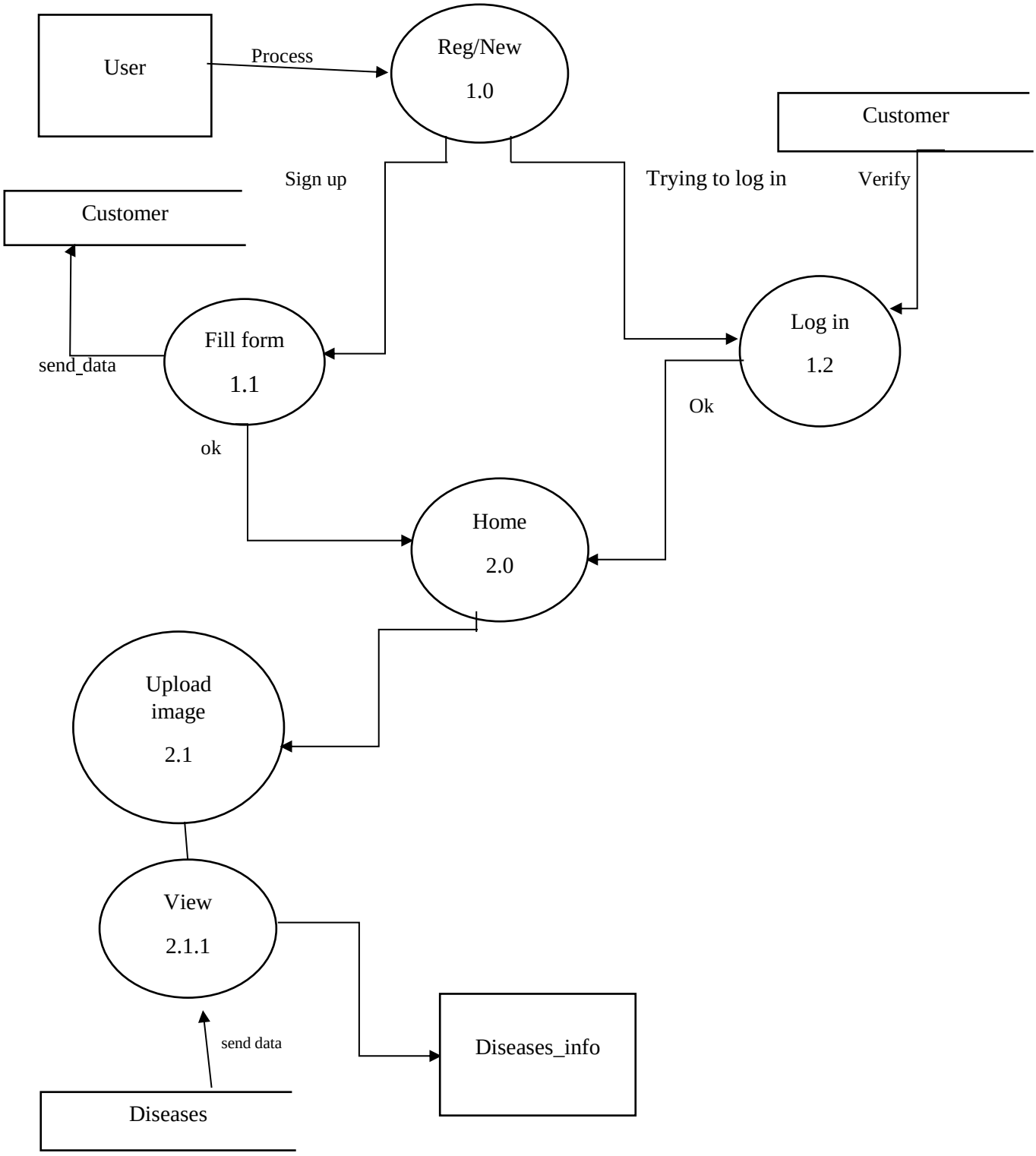
- **CONTEXT LEVEL DIAGRAM (0 LEVEL DFD):**



➢ **ADMIN SIDE DFD: -**



➢ **USER SIDE DFD:**



# CHAPTER - 3

## 3.1 Convolutional Neural Network (CNN)

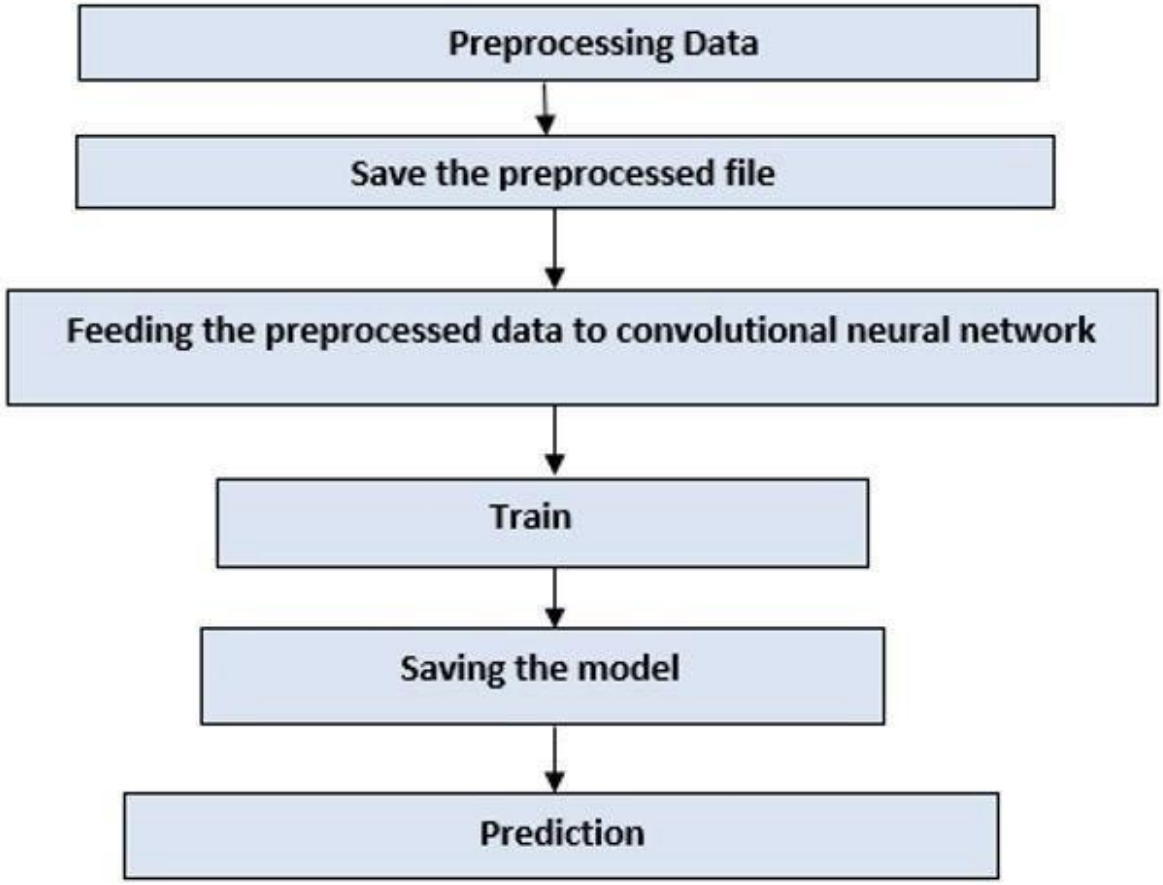
- CNN is a special type of feed forward neural network. CNN is used in image recognition, image classification, object detection and face recognition
- In CNN image is divided in pixels.
- Artificial Neural Networks are made of artificial neurons inspired by biological neurons present in our brain.
- CNNs can recognize a particular object even when it appears in different ways, as it understands translation invariance.
- CNN image classification takes an input image, process it and classified under certain category.
- CNN image classification takes an input image, and outputting class (cat, dog etc.) Or a probability of classes that best describe the image.
- CNN is a specialized type of neural network model designed for working with image data.
- CNN contain special type of layer which contain a filter that is able to understand certain type of pattern of the image.

## 3.2 BACKGROUND OF CNN

The diagnosis of the skin cancer is done by dermatologist where they can access the images of cancer patients and analyze the result whether the patient has cancerous cells or not. The issue with this framework is, it sets aside a lot of time to process a ton of patients and furthermore it takes a great deal of labor to expand the rate of recognition which makes the cost go up. The developing computerized system can automate this skin cancer detection process that will assist the dermatologists, and makes their works easier by this online platform. Convolutional neural network classifies images of skin disease.

## 3.3 METHODOLOGY

The methodology of the proposed system for detection, extraction, and classification of the skin disease. The system will help significantly in the detection of melanoma, Actinic keratoses and basal cell carcinoma, benign keratosis, vascular lesion. The whole architecture is divided into several modules like preprocessing , features extraction and classification**.**




- **FLOW CHART FOR THE SYSTEM USIGN CNN**

## 3.4WORKING OF CNN

3 **Step1:** Initializing all the images and all the parameters that

are needed for system.

- **Step2:** The system takes a training image as input and saves

the images into the system.

- **Step3:** The system uses convolutional neural network and finds out the prediction.
- **Step4:** Training with the convolutional neural network that

are generated

- **Step5:** Save the model into the system for prediction of the

test data.

- **Step6**: Evaluate the result with the standard evaluation metrics like accuracy, precision, recall, and f1 score**.**

**Step 1: Preprocessing data-** In compute vision, one of the main obstacles are the huge size of the images. The input data can be very big. The input feature dimension can be 14700 is the inputted images are 70×70×3. Suppose the image size is 1024×1024×3 then the feature size will be huge for computation to pass it to a deep neural network specially convolutional neural network (depending on the number of hidden units). There are three channels of images . The three channels are RGB (Red, Green, Blue). Because of the lack of computational capacity, we need to attempt to characterize a solitary channel when we read the picture. Another issue is the span of the picture. The data set containing the pictures that is exceptionally huge in width and height. The width of the picture is 1022 and the height of the picture is 767 which is extremely substantial to process and needs considerably more computational capacity to register several pictures which is very time consuming and wastage of memory. Along these lines, we need to resize the information pictures so our machine can process the pictures with less memory and graphical computational power. To tackle these two problems while reading the images, it will be defined such a way that only one-color channel remains. For our cases, gray scale images are generated from original images that is easier for CPU to process.

(ORIGINAL IMAGE)

(RESIZING IMAGE)

**Step 2: Save the preprocessed file-** Each of the preprocessed images are saved in the record along with their classes. From the dataset, benign and malignant images are taken for further processing. We have to discard the images that do not have any class label. Finally, the recorded images are used to feed to a convolutional neural network.

**Step 3: Feeding the preprocessed data to convolutional neural network (CNN).** Three types of layers are present in a Convolutional Neural Network. That are given in following part-

• Convolution layer

• Pooling layer

• Flatting

• Fully connected layer

| | | | | | |
|---|---|---|---|---|---|
| 5 | 3 | 2 | 1 | 7 | 4 |
| 3 | 5 | 8 | 9 | 1 | 3 |
| 2 | 5 | 6 | 0 | 1 | 4 |
| 1 | 6 | 7 | 1 | 0 | 2 |
| 6 | 2 | 4 | 0 | 8 | 2 |
| 2 | 5 | 4 | 2 | 3 | 9 |

*

| | | |
|---|---|---|
| 1 | 0 | -1 |
| 1 | 0 | -1 |
| 1 | 0 | -1 |

**Figure 3. $6 \times 6$ image with $3 \times 3$ filter.**

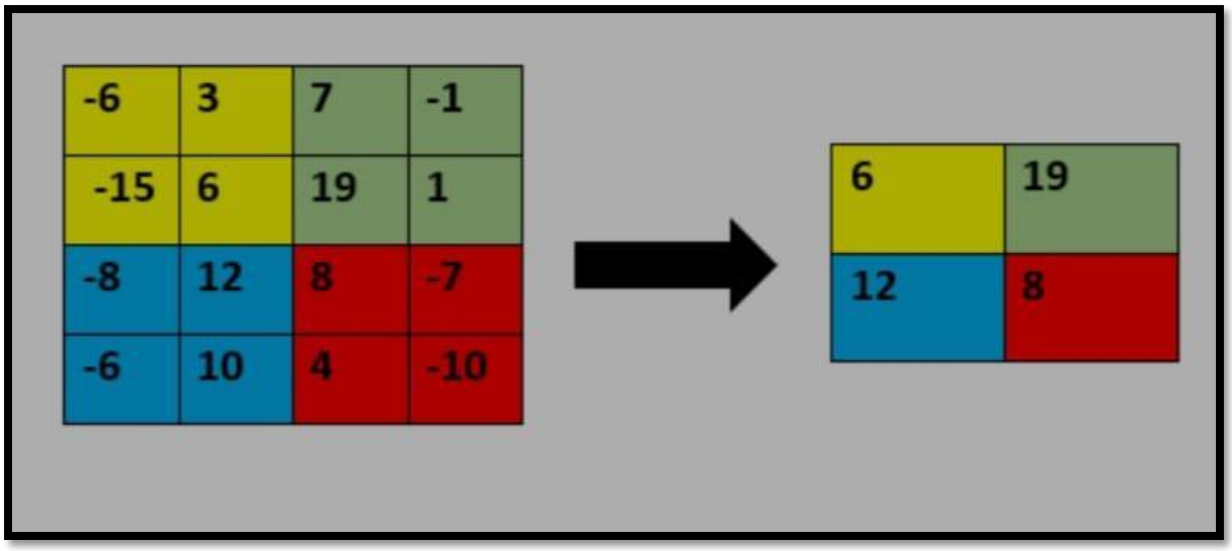
| | | | |
|---|---|---|---|
| -6 | 3 | 7 | -1 |
| -15 | 6 | 19 | 1 |
| -8 | 12 | 8 | -7 |
| -6 | 10 | 4 | -10 |

**Figure 4. $4 \times 4$ image after applying $3 \times 3$ filter to $6 \times 6$ image.**

**CONVOLUTIONAL LAYER-** A convolutional layer is the main building block of a CNN. It contains a set of filters, parameters. It extracts features from input image. It preserves the relationship between pixels by learning image features using small square of input data. It is a mathematical operation that takes two input such as image matrix and a filter. The filter is traversed through the image and multiplied with the pixels value to obtain feature map. Let's take example, e. Suppose we have a 6 × 6 gray-scale image and takes 3 × 3 filter. Firstly, 3 × 3 matrix were taken from the 6 × 6 image and accumulate the filter with it. As a result, the sum of the element-wise product of these values equals to the first element of 4×4 output,

For examples: $5\times1+0+2\times-1+3\times1+5\times0+8\times-1+2\times1+5\times0+6\times-1 = -6$ The second element of 4 × 4 output were calculated again by the sum of the element-wise product via shifting the filter one unit at the right. Similarly, the entire image was convoluted to produce a 4 × 4 output.

**POOLING LAYER-** Pooling layer helps in decreasing the number of parameters when the image is very large in size. we use max pooling in our system -Max pooling is a pooling operation that selects the maximum elements from the region of the feature map covered by the filter. It is done but applying a N x N max filter over the image, which selects the highest pixels value and build the feature map. It will reduce the size and increase computation speed.




- **RESULT AFTER APPLYING MAX POOLING**

**FLATTENING-** It is used to convert all the resultant 2-dimensional array into single long continuous linear vector. For artificial neural network, we need a single column vector of the image pixels.

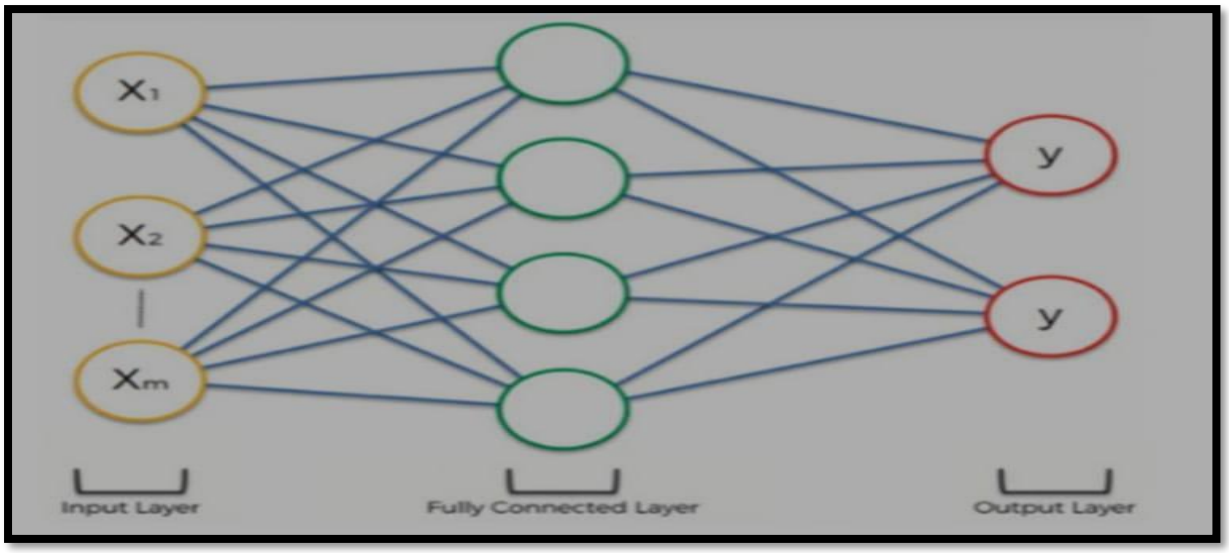
**(POOLED FEATURE MAP)**

| | |
|---|---|
| 6 | 19 |
| 12 | 8 |

**FLATTENING**

| |
|---|
| 6 |
| 19 |
| 12 |
| 8 |

**FULL CONNECTION-** Fully connected layer is simply, feed forward neural network. fully connected layer in a neural network is those layers where all the input from one layer is connected to every activation of the next layer. The last few layers are full connected layer which compiles the data extracted by previous layer to form the final output. The full connection layer takes the input from the preceding convolution/pooling layer and produces an N dimensional vector where N is the number of classes to be classified. Thus, the layer determines the features most corelating to a particular class based on the probabilities of neurons



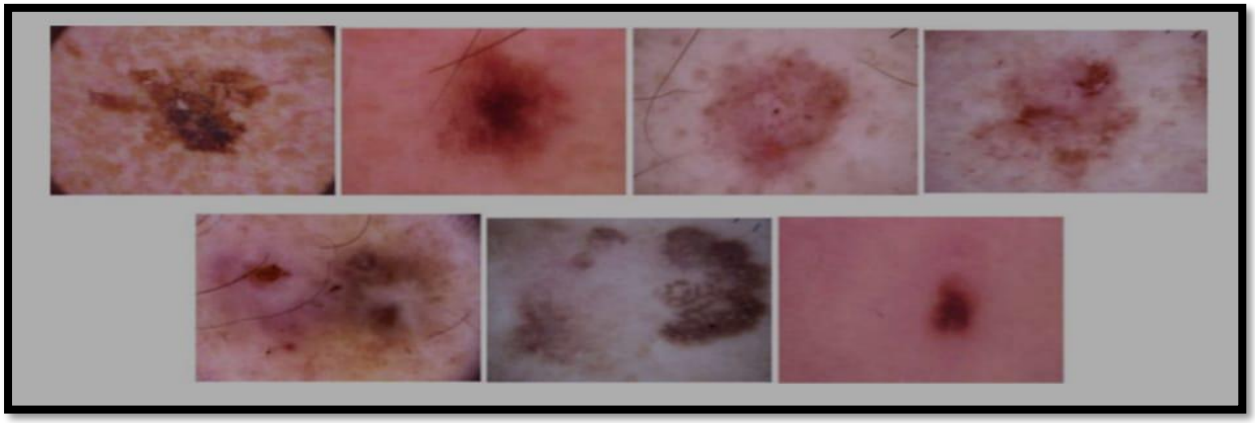

**Step 4: TRAIN-** We have to train our model up to 200 times .Every time the loss of the system decreases to a certain level. While training epochs is approximately 180, then we didn't notice any significant amount of change in loss. So, we have to stop us iteration at 200.

**Step 5: SAVING THE MODEL-** Model is saved for further testing purposes. The model is then used to predict the images that might contain malignant or benign images.

**Step 6: PREDICTION-** We have to predict the images using the final output layer. After the prediction of the testing images, we evaluate our system with the accuracy, precision, recall and F1 score measures.

# DATASET

The International Skin Imaging Collaboration (ISIC): Melanoma Project is a partnership between industry and academia in order to facilitate the application of digital skin imaging to help curtail skin cancer mortality. Starting from 2015, ISIC started to organize global challenges for skin lesion analysis for melanoma diagnosis and detection.



- SAMPLE IMAGE FROM THE ISIP DATASET (ARRANGE IN ASSENDING ODER OF LESION TYPE-MELANOMA, MELALOCYTICNEVUS, BASAL CELL CARCINOMA, ACTINIC KERATOSIS, BENIGN KERATOSIS, DERMATOFIBROMA AND VASCULAR DESIGN)

This dataset which was 'ISIC 2018' contains 10,015 images of 7 types of skin lesion diseases namely: Benign Keratosis, Dermatofibroma, Vascular Lesion, Melanoma, Melanocytic Nevus, Basal Cell Carcinoma and Actinic Keratosis. These images were collected with approval of Medical University of Vienna and University of Queensland. These images are used to predict skin disease and cancer.

`

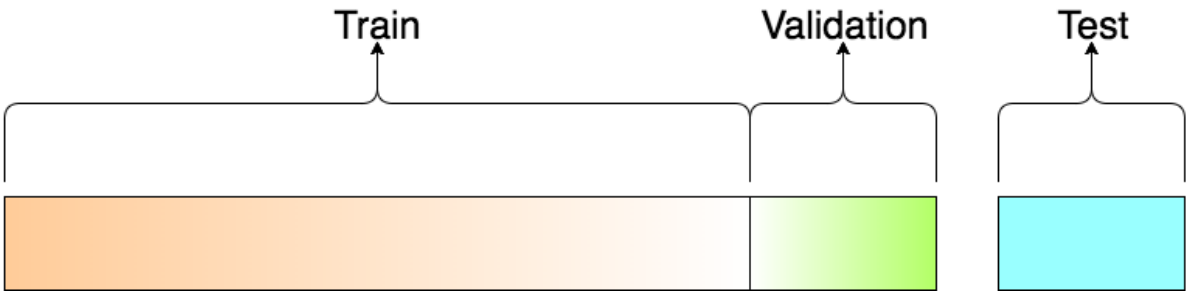
| | |
|---|---|
| Dataset | ISIC challenge 2018 |
| Type | Dermoscopic |
| Image size | 600 pixels × 450 pixels |
| Number of images | 10,015 |
| Image type | JPEG (RGB) |
| Class labels | 0: Melanoma<br>1: Melanocytic Nevus<br>2: Basal Cell Carcinoma<br>3: Actinic Keratosis<br>4: Benign Keratosis<br>5: Dermatofibroma<br>6: Vascular Lesion |

- Training Dataset and Testing Dataset-

**TRAINING DATASET**: - The sample of data used to fit the model. The actual dataset that we use to train the model (weights and biases in the case of a Neural Network). The model *sees* and *learns* from this data. The training data is an initial set of data used to help a program understand how to apply technologies like neural networks to learn and produce sophisticated results. It may be complemented by subsequent sets of data called validation and testing sets.

Training data is also known as a training set, training dataset or learning set.

**TESTING DATASET: -** The sample of data used to provide an unbiased evaluation of a final model fit on the training dataset. The Test dataset provides the gold standard used to evaluate the model. It is only used once a model is completely trained (using the train and validation sets). The test set is generally what is used to evaluate competing models. The test set is generally well curated. It contains carefully sampled data that spans the various classes that the model would face, when used in the real world.




## MODULE WORKING IN TRAINING DATSET AND TESTING DATASET

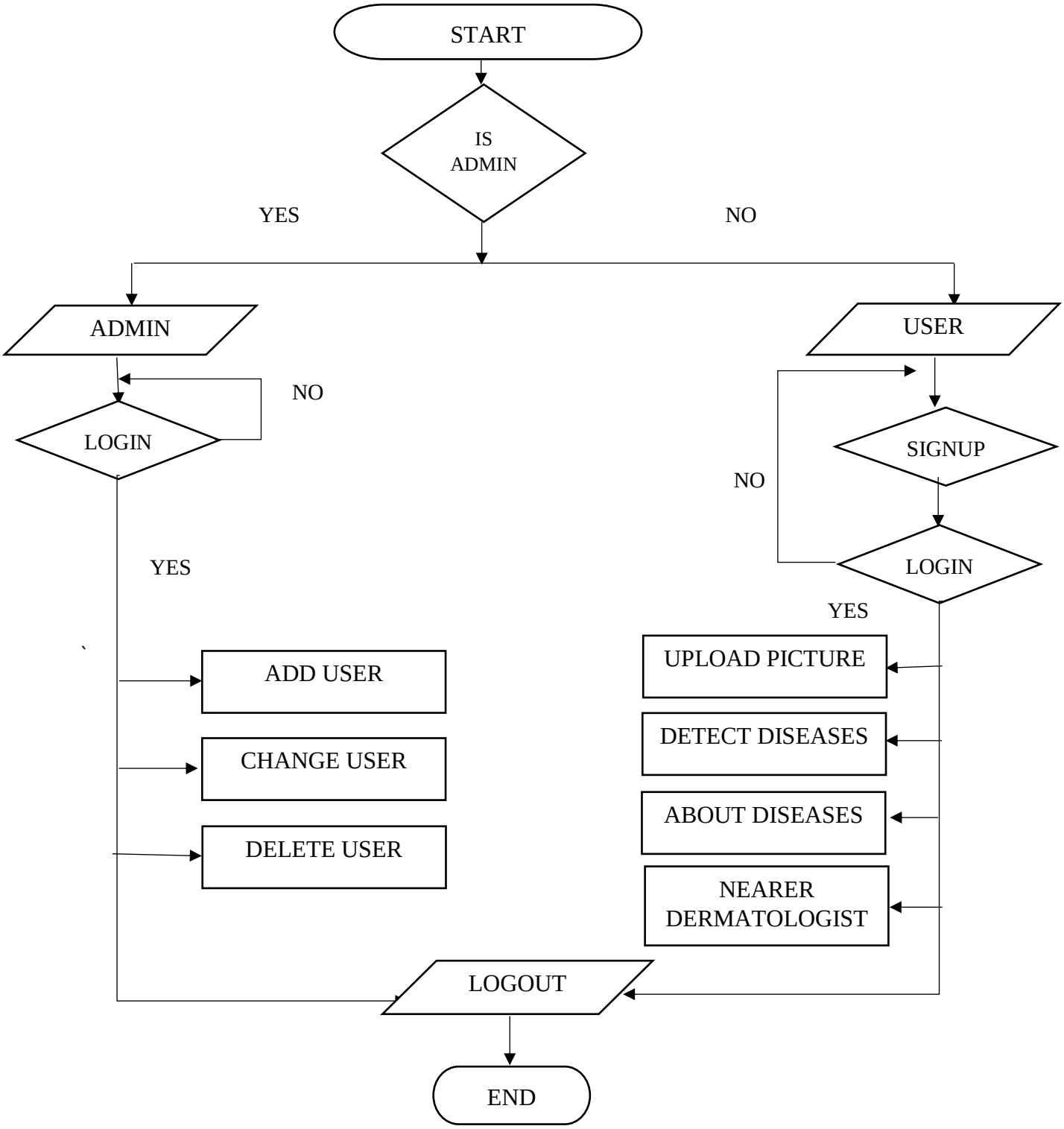
In our module we have 10,000 of skin diseases where our module in divided in both training dataset and testing dataset

- In Training dataset, we have divided it in 90%
- And, in Testing dataset we have divided it in 10%

# CHAPTER - 4

# 4 SYSTEM DESIGN: -

**4.1 SYSTEM FLOW CHART: -** The system flow diagram is a visual representation of all processed in sequential order. The System flow chart diagram is a graphical representation of the relation between all the major parts or step of the system. Flow chart diagram cannot include minor parts of the system



## 4.2 SCHEME OF DATABASE

### 1.TABLE NAME- USER

| S.NO. | Name | Data-Type | Key |
|---|---|---|---|
| 1. | Name | Varchar(80) | - |
| 2. | UserName | Varchar(50) | Primary |
| 3. | Email | Varchar(80) | - |
| 4. | Password | Varchar(30) | - |
| 5. | Age | Int(20) | - |
| 6. | BloodGroup | Varchar(3) | - |
| 7. | Any Disease | Varchar(100) | - |

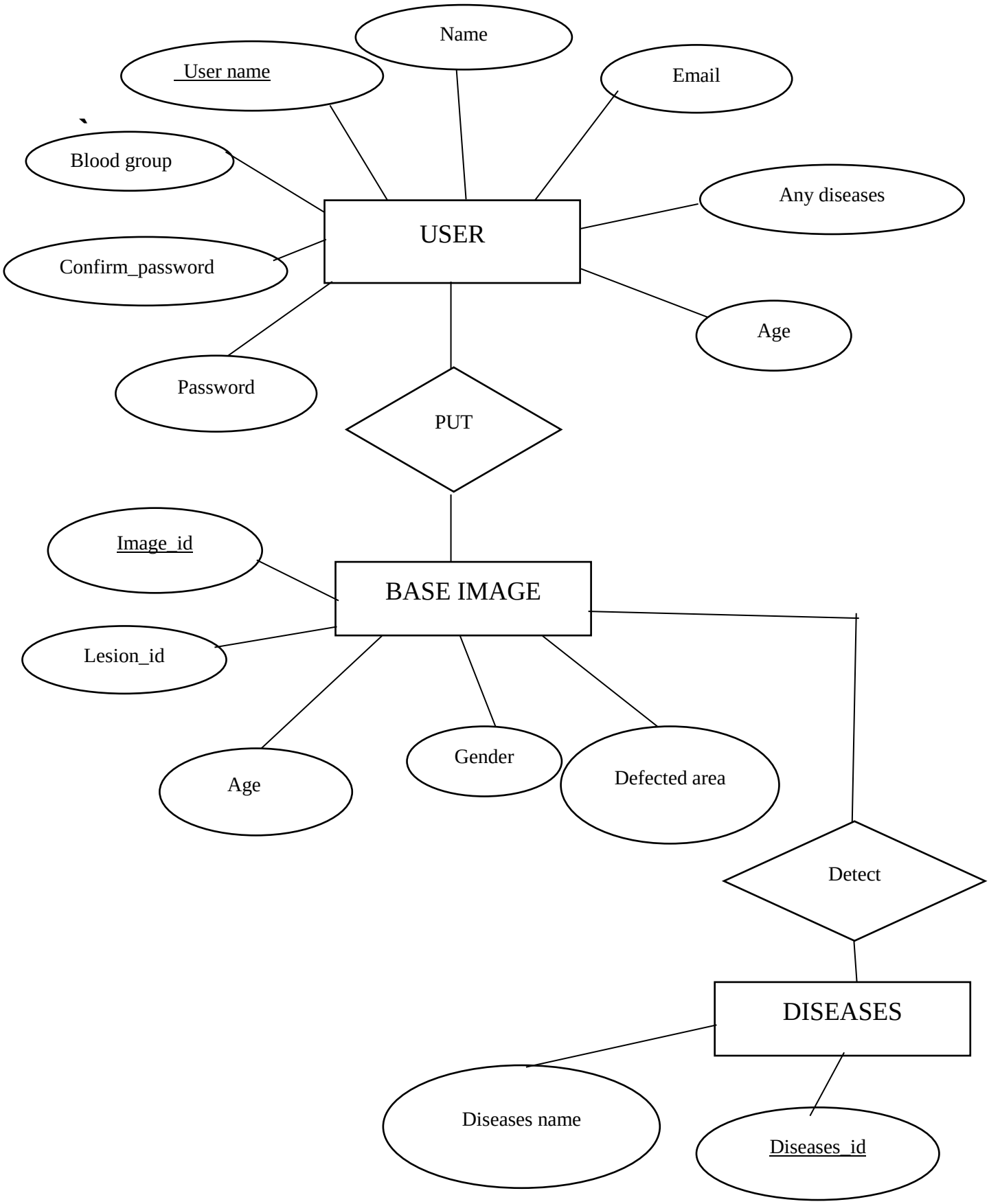
### 2.TABLE NAME- BASE IMAGE

| S.NO. | Name | Data-Type | Key |
|---|---|---|---|
| 1. | Lesion_Id | Varchar(50) | - |
| 2. | Image_Id | Varchar(50) | Primary |
| 3. | Gender | Varchar(50) | - |
| 4. | Age | Int(20) | - |
| 5. | Defected Part | Varchar(50) | - |

### TABLE NAME- DISEASES

| **S.NO.** | **Name** | **Data-Type** | **Key** |
|---|---|---|---|
| **1.** | Dermatologist name | Varchar(50) | - |
| **2.** | Address | Varchar(100) | - |

## 4.3 ER DIAGRAM: -



# CHAPTER - 5

# 5 CODING / TESTING: -

## 5.1 IMPORTANT OF TESTING:

- **What is the importance of software testing?**

Project testing is important or better to use the word critical for a project because nobody likes a software with defects. Just to take an example: If you create an account on Dermatologist Analysis and if this web-portal has been full of defects or if you kept received a server error every time, when you are trying to create an account on this web-portal. Would you prefer this software? I think answer would be NO. So, when this web-portal will be complete then we have to ensure that every module (features or functionalities) is free from error. That's why project testing is important part of a project.

- **What is the importance of software implementation?**

In the project implementation phase, this phase ensures some parameters like something operating properly in its environment, including analyzing requirements, installation, configuration, customization, execution, testing, systems integrations, user training, and delivery and making necessary changes. If these all are successfully work in the then that means your project is properly setup, otherwise user will face some problems when user use this project, that's why the software implementation is important part for all project

## 5.2 TESTING

Testing is a process, to evaluate the functionality of a software application with an intent to find whether the developed software met the specified requirements or not and to identify the defects to ensure that the product is defect-free in order to produce the quality product. So here we are using three testing approaches to check that the developed system met the specified requirements or not.

### 5.2.1 UNIT TESTING:

This is the testing process, which we can do manually because in this testing program is a tested individually using live record, to see whether that program produce satisfied output as the company or not. In this testing, we checked the individual modules of the project will be working properly or not. i.e., we tested each and every unit of the application separately in developer's environment

### 5.2.2 INTEGRATION TESTING

In integration testing, system consists different modules, where in each module can arise problems during the testing. Integration testing should be developed from the system specification. Firstly, a minimum configuration must be integrated and then tested.

In our project we have done integration testing. In our project we can integrate all module and then we have tested each module with each other, like a user. When a user visit on our web-portal, how the user will react when they saw our web-portal so, each module is tested by me and our development team.

### 5.2.3VALIDATION TESTING:

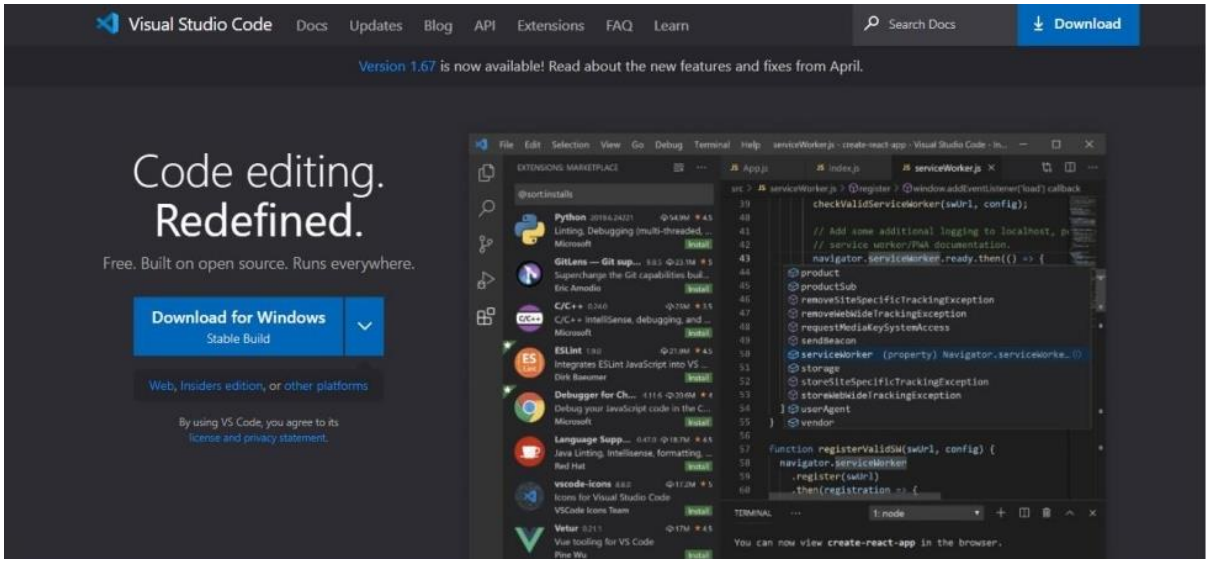
Validation testing provides final assurance that software meets all behavioral and performance requirements. Validation can be defining in many ways but a simple definition is that validation succeeds when software function in a manner that can be reasonably by the customer. In this testing we had tested the connectivity or data transfer between a couple of units tested modules.

# CHAPTER - 6

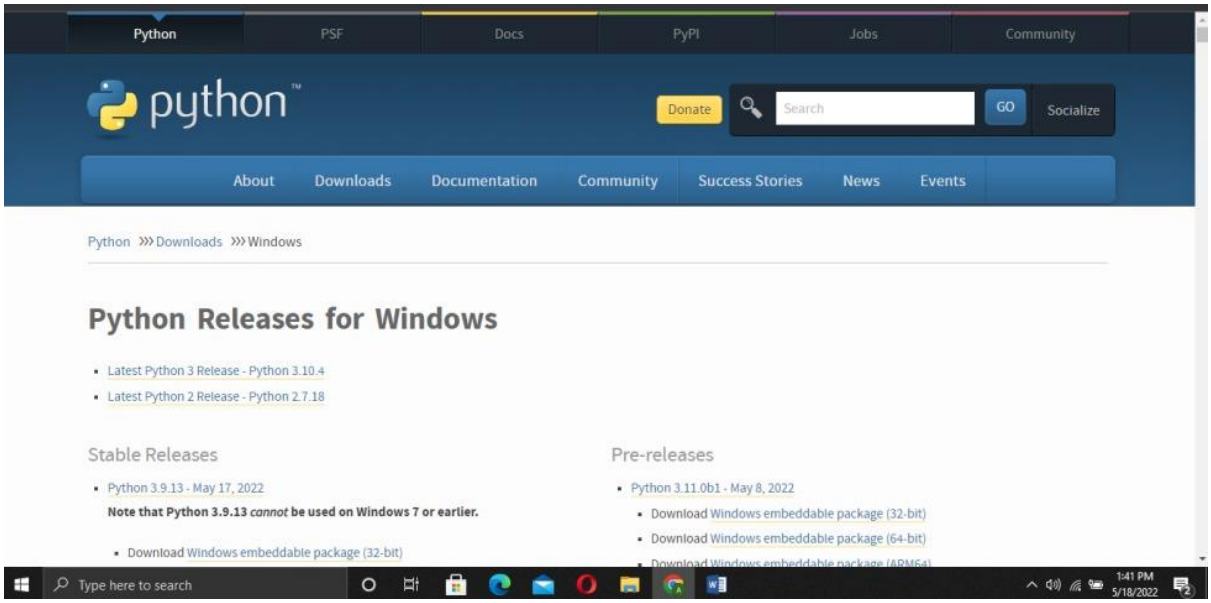
## 6. Implementation Details: -

Step:1 Getting a Text Editor: -

I use Visual Studio code as the text Editor because it has several plugins and built-in terminal features.




Step 2: Installing Python in local Machine



1. Download latest version of python which is suitable with machine.

2. And install the python and check that python is working all good.

Step:3 Installing Django: -

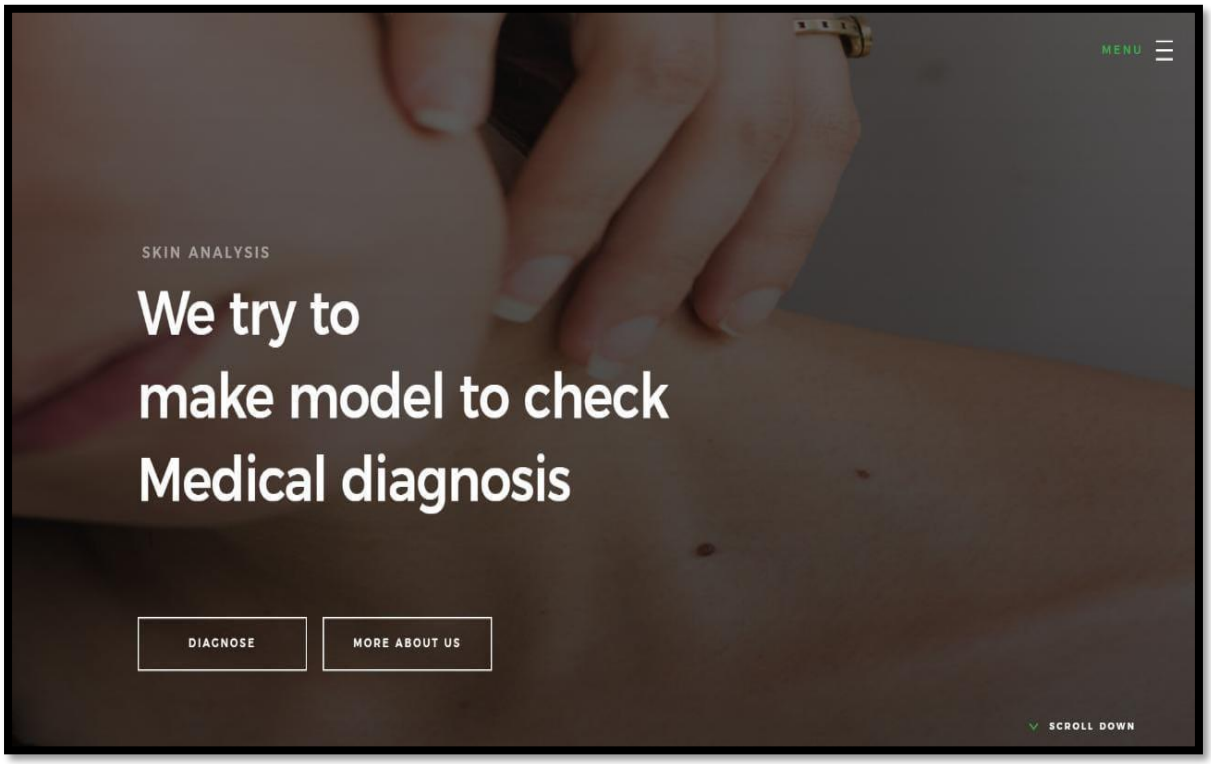
1. Now we have to install Django in system so we have to follow this command.

Pip install Django

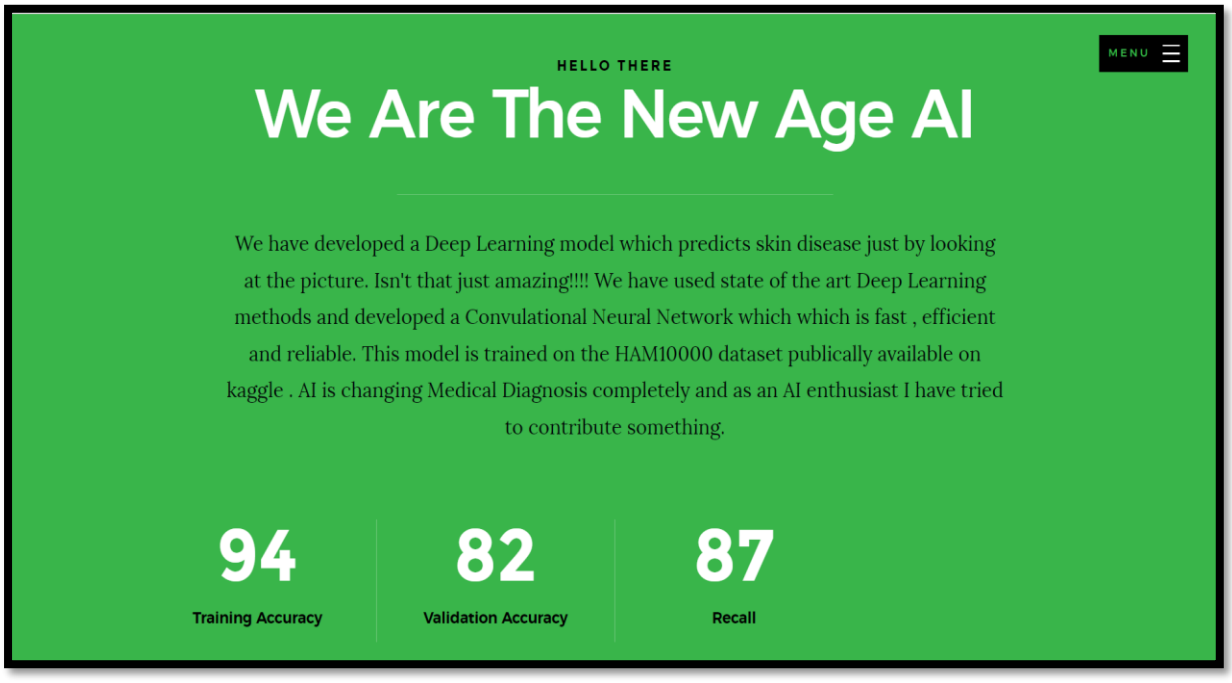
# CHAPTER - 7

# 7SAMPLE FORMS

- **HOME PAGE**



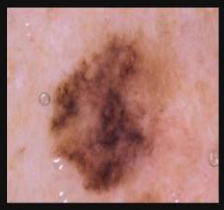

- **ABOUT US**



## SKIN DISORDER

MENU

# What are skin disorders?



Skin disorders vary greatly in symptoms and severity. They can be temporary or permanent, and may be painless or painful. Some have situational causes, while others may be genetic. Some skin conditions are minor, and others can be life-threatening. While most skin disorders are minor, others can indicate a more serious issue.

In the observational study, skin diseases contributed 1.79% to the global burden of disease measured in disability-adjusted life years (DALYs). Skin diseases arranged in order of decreasing global DALYs are as follows: dermatitis (atopic, contact, seborrheic), acne vulgaris, urticaria, psoriasis, viral skin diseases, fungal skin diseases, scabies, melanoma, pyoderma, cellulitis, keratinocyte carcinoma, decubitus ulcer, and alopecia areata. Skin diseases remain a major cause of disability worldwide. An objective measure of burden, such as the DALY, allows for comparison of diverse diseases across geography and time.

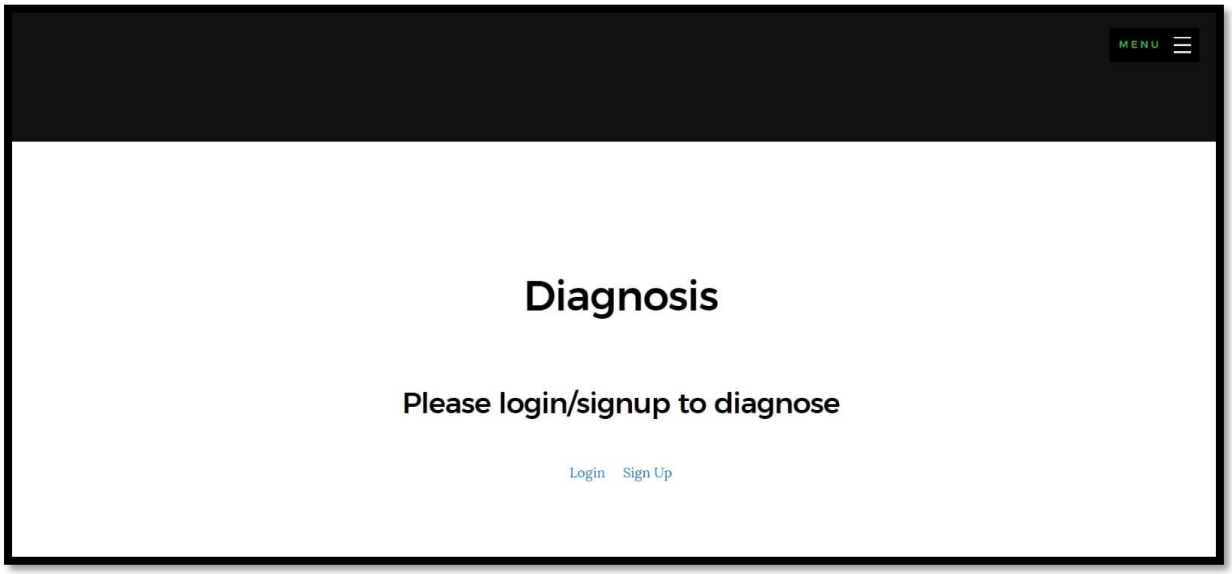
MENU

Disability secondary to skin conditions is substantial worldwide. The Global Burden of Disease Study 2013 includes estimates of global morbidity and mortality due to skin diseases. For nonfatal estimates, data were found by literature search using PubMed and Google Scholar in English and Spanish for years 1980 through 2013 and by accessing administrative data on hospital inpatient and outpatient episodes. Data for fatal estimates were based on vital registration and verbal autopsy data.

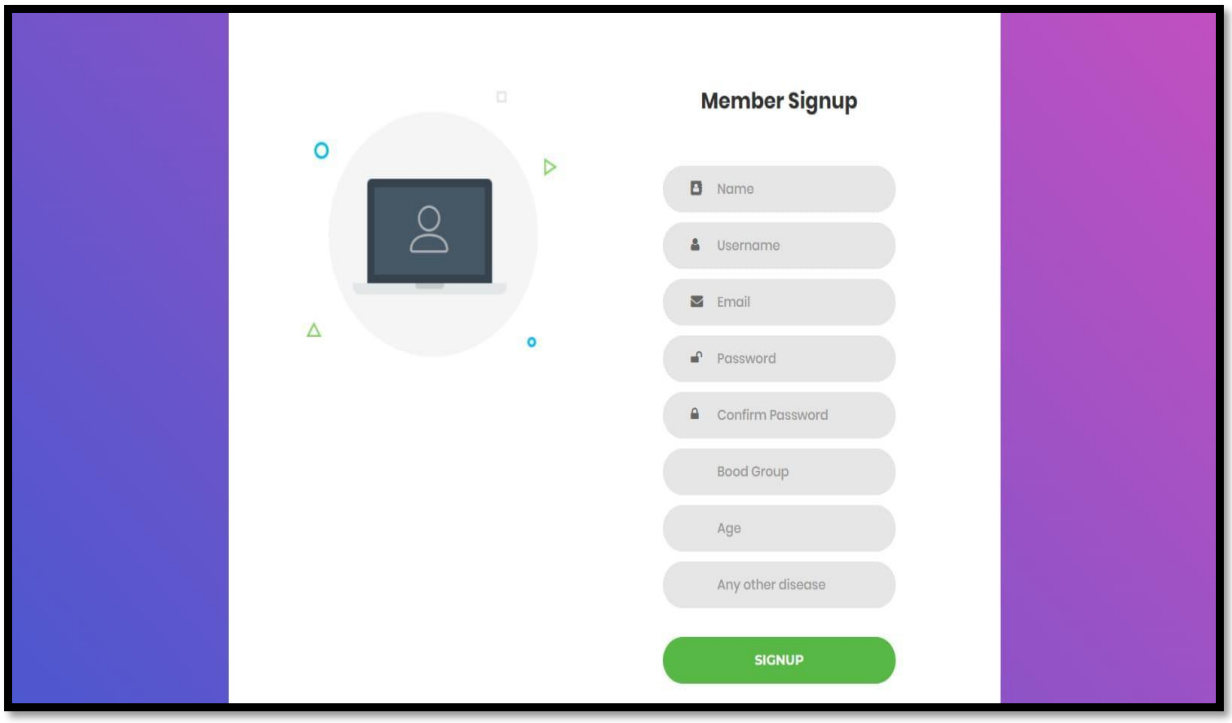
Skin conditions contributed 1.79% to the global burden of disease measured in DALYs from 306 diseases and injuries in 2013. Individual skin diseases varied in size from 0.38% of total burden for dermatitis (atopic, contact, and seborrheic dermatitis), 0.29% for acne vulgaris, 0.19% for psoriasis, 0.19% for urticaria, 0.16% for viral skin diseases, 0.15% for fungal skin diseases, 0.07% for scabies, 0.06% for malignant skin melanoma, 0.05% for pyoderma, 0.04% for cellulitis, 0.03% for keratinocyte carcinoma, 0.03% for decubitus ulcer, and 0.01% for alopecia areata. All other skin and subcutaneous diseases composed 0.12% of total DALYs.

Skin and subcutaneous diseases were the 18th leading cause of global DALYs in Global Burden of Disease 2013. Excluding mortality, skin diseases were the fourth leading cause of disability worldwide.

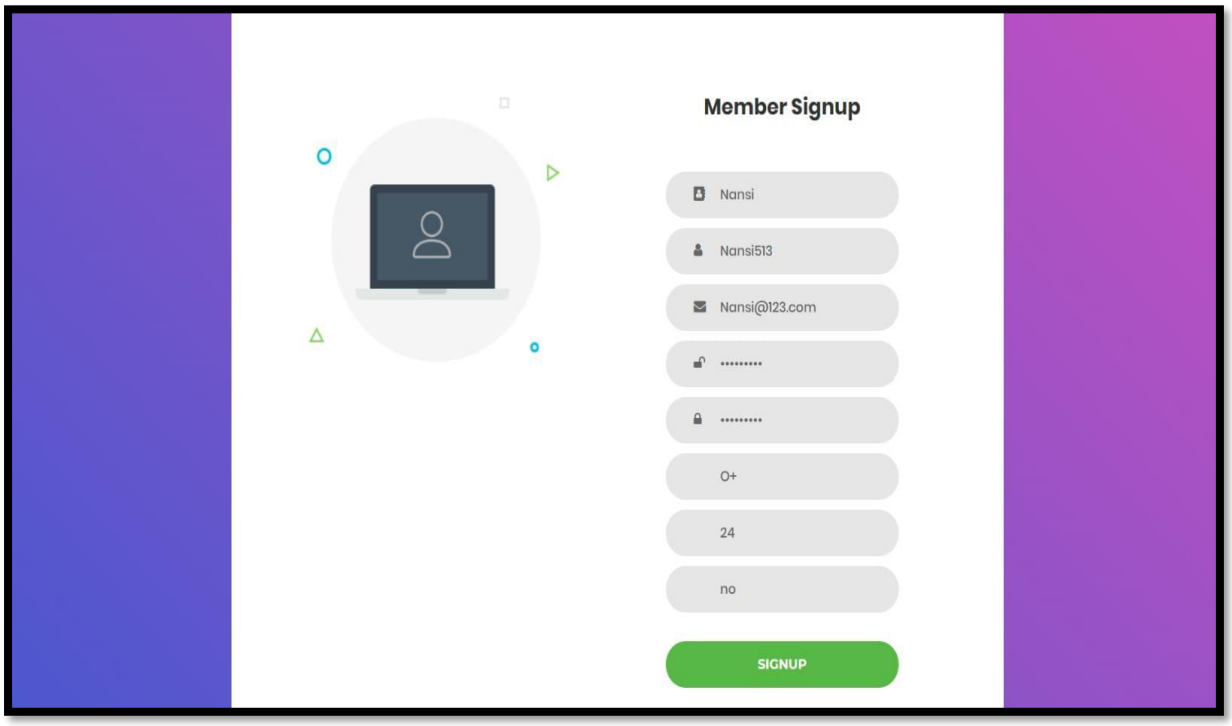
## SIGNUP / LOGIN



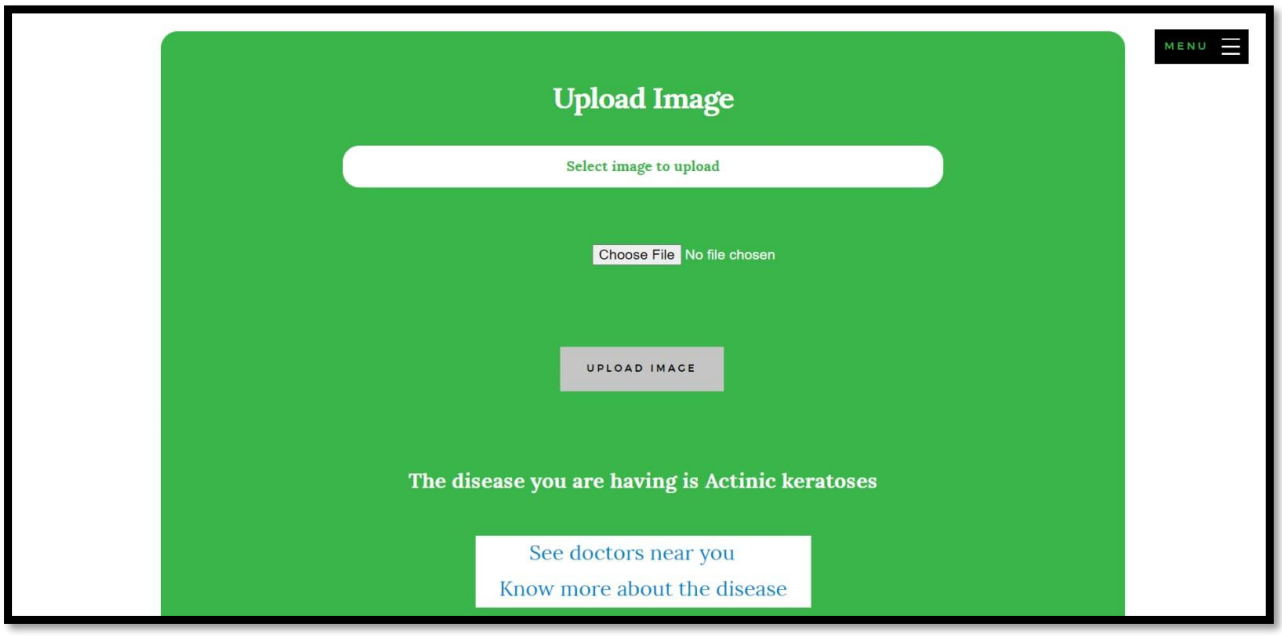

## USER LOGIN



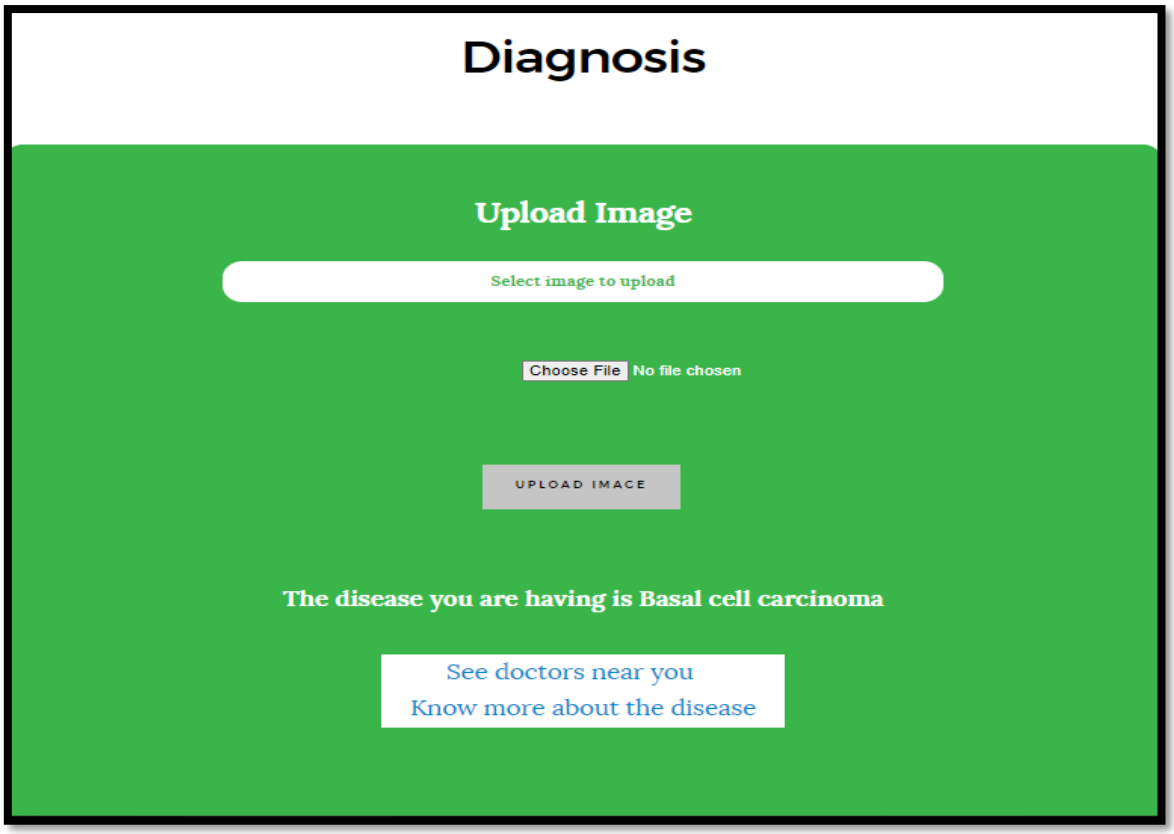
## USER LOGIN EXAMPLE



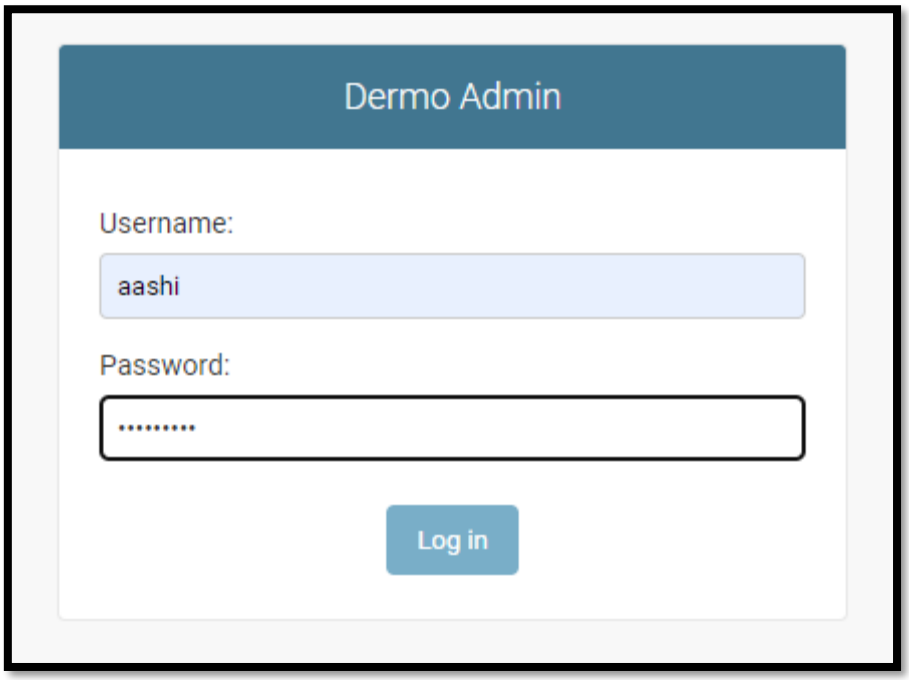

## DIAGNOSIS



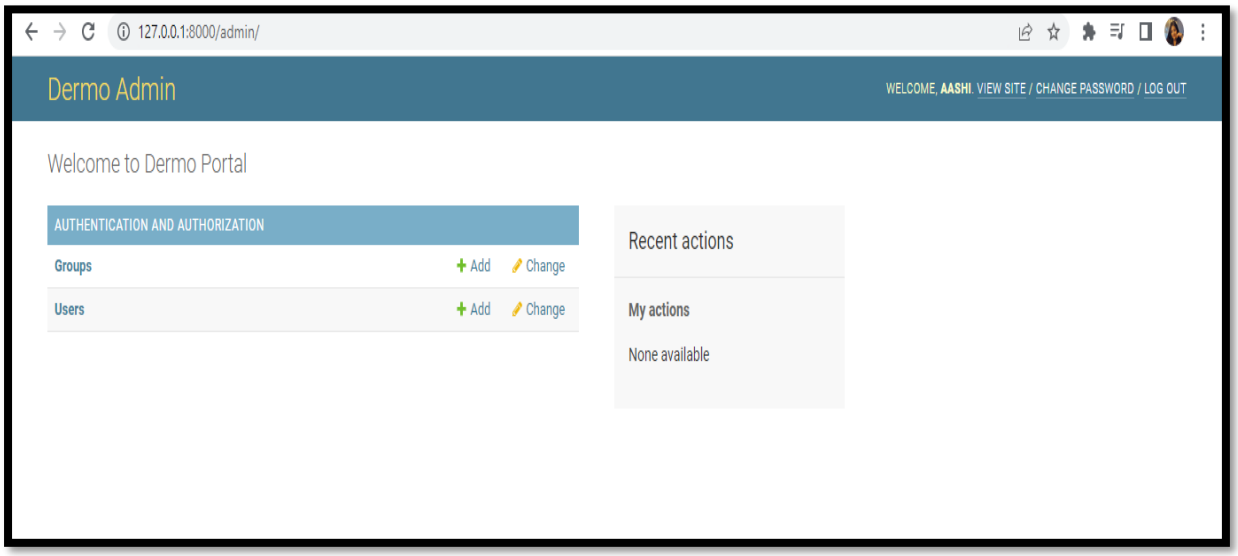

- **DIAGNOSIS EXAMPLE**

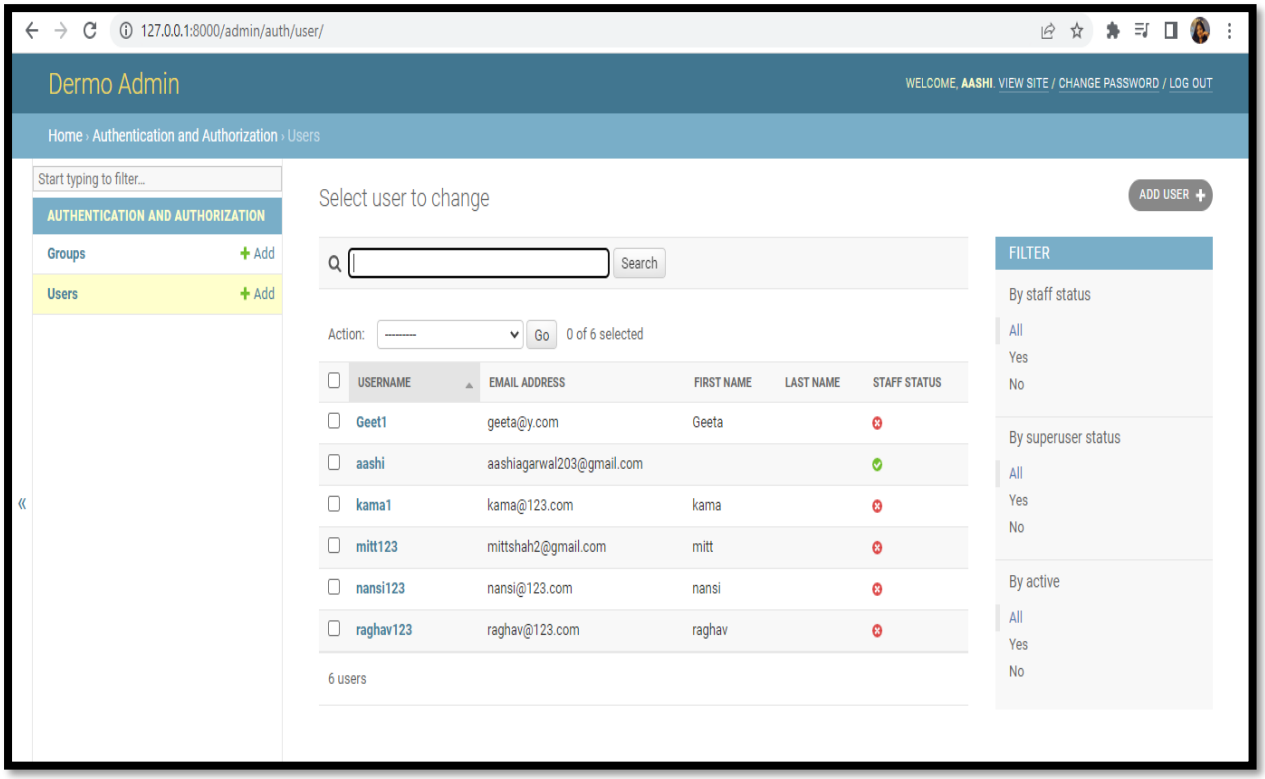

Diagnosis
Upload Image
Select image to upload
Choose File No file chosen
UPLOAD IMAGE
The disease you are having is Basal cell carcinoma
See doctors near you
Know more about the disease

- **ADMIN**

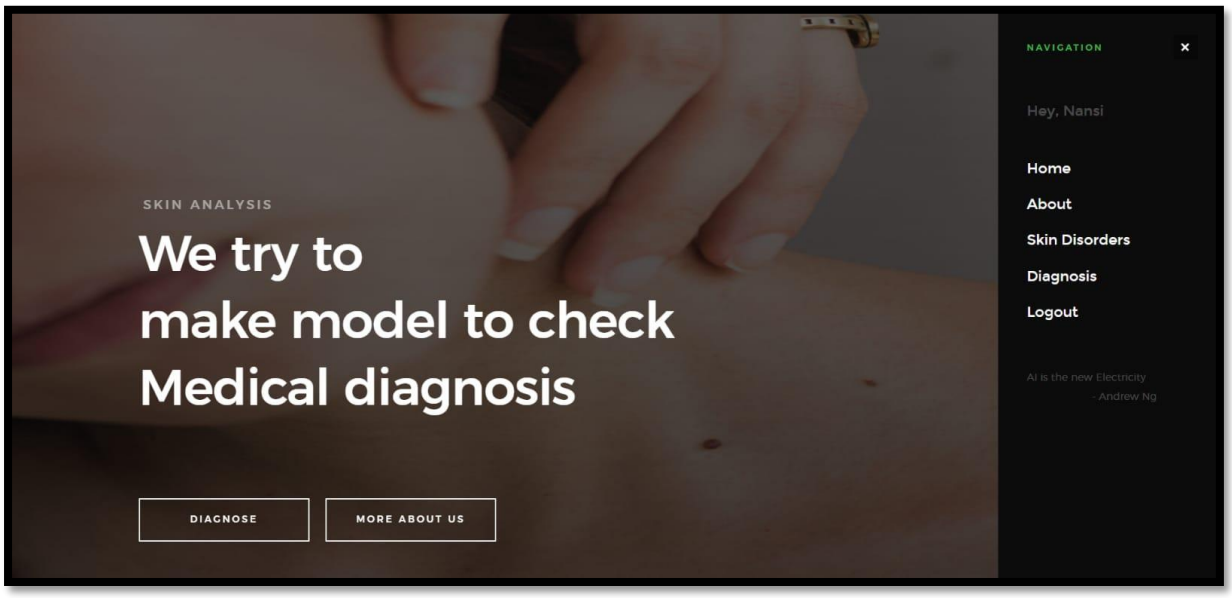

Dermo Admin
Username:
aashi
Password:
Log in

# ADMIN DASHBOARD



# LOG OUT


SKIN ANALYSIS
We try to
make model to check
Medical diagnosis
DIAGNOSE
MORE ABOUT US
NAVIGATION
Hey, Nansi
Home
About
Skin Disorders
Diagnosis
Logout
AI is the new Electricity
- Andrew Ng

# CHAPTER - 8

# 8.1 CONCLUSIONS

"Dermatologist analysis" aims are to provide an online platform where users can find which kind of skin diseases they are facing. Saving time and money is our main motive for our user. User can easily find the diseases name and information by putting images of their infected parts. They can also save their time by finding nearer dermatologist for their checkup.

We developed a flexible and easily manageable and time-saving platform. This project covers only the basic features required, the main beneficiary for the user is they can be aware at the very first stage of their diseases. They can follow the basics precautions so that disease cannot spread more, as this is the human nature some one feel shame, someone feel that after sometime we will get it check, someone feel it's a waste of money for them this is a better platform they can find out the problem easily at their places.

In the end, we would like to say that we have tried our level best to develop a solution to the problems above. The project entitled "Dermatologist analysis" was completed successfully. The system has been developed with much care and try to free of errors and at the same time it is efficient and less time consuming.

# 8.2 FUTURE SCOPE

We will work on to improve user interface, which will help to make this web portal more user friendly. We will try to make it more effective and efficient and more accurate. We will try to provide more feature for the help of the users. We try to make our site with less bugs and try to fix all the debugs and will improve the demerits of our site.

# 8.3 BIBLIOGRAPHIES


- YouTube
- Online Tutorials Library (tutorialspoint.com)
- Wikipedia
- W3Schools - Wikipedia
- **https://docs.djangoproject.com/en/4.0/intro/tutorial01/**