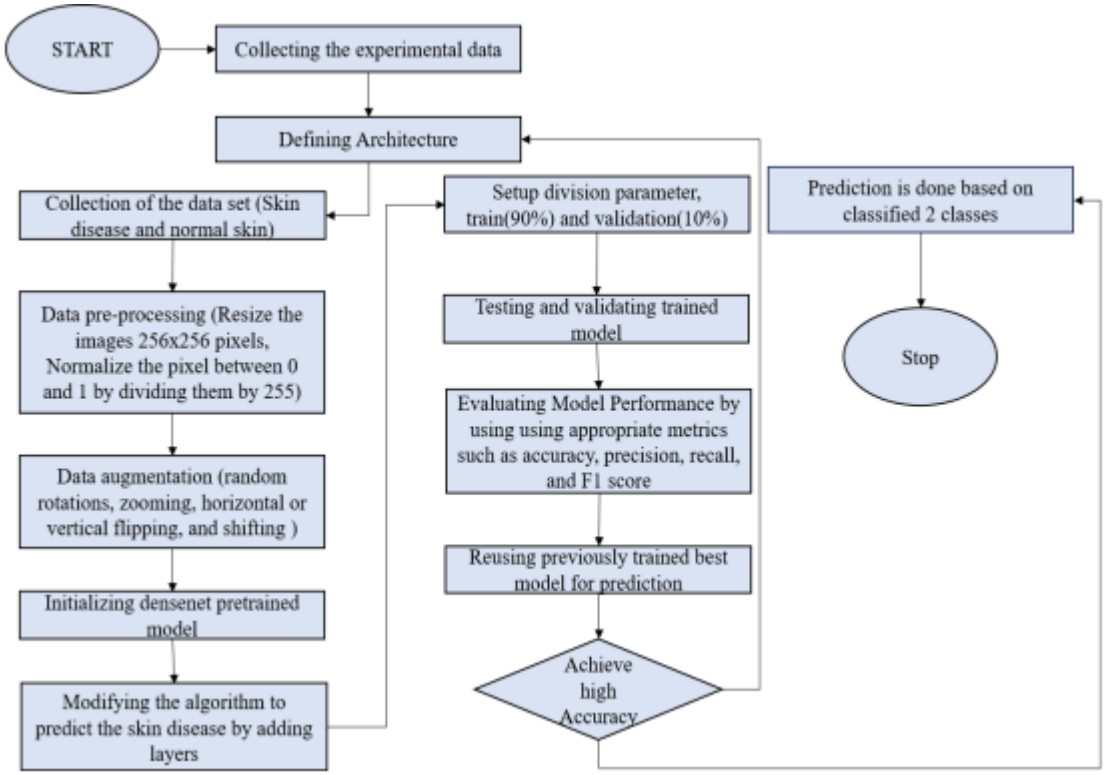
Project Planning Phase – I

Technology Stack (Architecture and Stack)

Date	25th October 2023
Team ID	
Project Name	Predicting Lumpy Skin Disease
Maximum Marks	4 Marks

Technological Architecture

The technical architecture of a web app for predicting lumpy skin disease using a **Convolutional Neural Network** involves multiple components that work together to deliver a functional and efficient application.



Component and Technologies :

S.no	Component	Description	Technology
1	Front-end	The user interface that allows users to interact with the application. It includes elements like input forms, image uploads, and result displays.	HTML, CSS, JavaScript, React, Angular, Vue.js
2	Back-end	The server-side of the application responsible for handling user requests, processing data, and interfacing with the machine learning model.	Python, Flask, Django, Node.js, Express.js
3	Database	Storage for user profiles, image data, and potentially the model parameters. Can be SQL or NoSQL, depending on the data requirements..	PostgreSQL,MySQL,MongoDB,Firebase Realtime Database
4	Machine Learning Model	The CNN model trained to predict lumpy skin disease from images. It processes input images and generates predictions.	TensorFlow, PyTorch, Keras
5	Image Processing	Preprocessing and manipulation of input images, including resizing, normalization, and data augmentation.	OpenCV, Pillow, Python Imaging Library (PIL)
6	User Authentication	User authentication and authorization to secure user data and model access.	OAuth, JWT tokens, Firebase Authentication
7	Cloud Deployment	Hosting the web app on cloud platforms for scalability, reliability, and global accessibility.	Amazon Web Services (AWS), Microsoft Azure, Google Cloud Platform (GCP)
8	Image Storage	Storing and managing user-uploaded images and model-related data.	AWS S3, Google Cloud Storage, Dropbox
9	Payment Processing	Handling payments, if the app charges users for access or premium features.	Stripe, PayPal, Square, Braintree
10	Third-Party APIs	Integration of external services,like geoloaction services or disease database APIs	Google Maps API, disease data APIs, etc.

Application and Characteristics:

S.no	Characteristic	Description	Technologies
1	User-Friendly Interface	Create an intuitive and user-friendly interface for easy interaction.	HTML, CSS, JavaScript, React, Angular, Vue.js
2	Real-time Image Upload	Allow users to upload images of skin lesions for disease prediction.	HTML file input, Python (Flask, Django) for server-side processing
3	Machine Learning Integration	Seamlessly integrate the trained CNN model for disease prediction	TensorFlow, PyTorch, RESTful API for communication
4	Data Storage and Retrieval	Store user data, images, and model-related data securely. Retrieve historical data for analysis and model improvement.	PostgreSQL, MySQL, MongoDB (for data storage), SQLalchemy, Mongoose (for database interaction)
5	User Authentication and Authorization	Implement secure user authentication to protect sensitive data and control access.	OAuth, JWT tokens, Firebase Authentication
6	Cloud Deployment	Deploy the application on cloud platforms for scalability and accessibility.	AWS, Azure, Google Cloud Platform (GCP)
7	Image Processing	Preprocess and normalize images before feeding them to the CNN model.	OpenCV, Pillow, Python Imaging Library (PIL)
8	Geolocation Services	If necessary, integrate geolocation services for location-specific data.	Google Maps API, Mapbox, Geocoding APIs
9	Payment Processing	Handle payments if users are charged for premium features	Stripe, PayPal, Square, Braintree, Payment gateways
10	Third-party APIs	Integrate external APIs to enhance the application's functionality, such as disease databases or additional resources.	External APIs (e.g., disease data APIs)

References :

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3. Alemayehu, G., Zewde, G., & Admassu, B. (2013). Risk assessments of lumpy skin diseases in Borena bull market chain and its implication for livelihoods and international trade. *Tropical Animal Health and Production, 45*(5), 1153–1159. 10.1007/s11250-012-0340-9 [PMC free article] [PubMed]

4. Alkhamis MA, VanderWaal K. Spatial and temporal epidemiology of lumpy skin disease in the Middle East, 2012–2015. *Frontiers in Veterinary Science.* 2016;3:19. doi: 10.3389/fvets.2016.00019. [PMC free article] [PubMed] [CrossRef] [Google Scholar]

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