Project Team #: 20CSM_B05

20BQ1A4237 - M.V.J.Priya

20BQ1A4261- V.S.L.Tirumala

20BQ1A4207- B.Bhargav

20BQ1A4254- T.Mahesh

Project Guide:

K. BALAKRISHNA B.Tech., M.Tech., MBA., DID., (Ph.D)

Project Name: Farmers can upload the photographs of disease affected plants/crops and solutions may be provided by experts/scientists linked to the app.

Abstract:

Agriculture plays a vital role in the socioeconomic fabric of India. Failure of farmers to decide on the best-suited crop for the land using traditional and non-scientific methods is a serious issue for a country where approximately 58 percent of the population is involved in farming. Sometimes farmers were failed to choose the right crops based on the soil conditions, sowing season, and geographical location. This results in suicide, quitting the agriculture field, moving towards urban areas for livelihood. Crops are recommended based on soil, weather, humidity, rainfall, and other variables to increase agricultural output. It benefits not just farmers, but also the country and helps to keep food costs down.

Agriculture is the backbone of the economy in many countries, contributing significantly to their Gross Domestic Product (GDP). The right choice of crop plays a critical role in ensuring good yield and profitability for farmers. However, farmers often face the challenge of selecting the right crop due to a variety of factors such as changing climate patterns, varying soil conditions, and limited knowledge about modern agricultural practices. It has been a major problem to identify what to grow, any man has adequate space in the owner's land. Not only domestic lands but also for farming lands. Why it has become a problem is that environmental factors such as temperature, water levels, and soil conditions are uncertain as they change from time to time To overcome this issue, this research work has proposed a system to assist the farmers in crop selection by considering all the factors like sowing season, soil, and geographical location. Furthermore, precision agriculture is being implemented with a modern agricultural technology and it is evolving in developing countries that concentrates on site-specific crop management. This paper presents the utilisation of machine learning approaches like Random Forest and Decision Tree to predict which crop is best for which soil type based on the data sets.

Title	GROWZ
Clients	Ministry of micro,Small and Medium Enterprises
Objective/Vision	The objective of GROWZ is to develop an intelligent crop recommendation system that assists farmers in making informed decisions about the most suitable crops to grow in their specific farming environment. By analyzing factors such as climate patterns, soil conditions, and modern agricultural practices, the system aims to provide accurate crop suggestions, leading to improved crop selection and increased yield. It will offer insights into market demands, enable optimized resource utilization, and promote better soil health through appropriate fertilization recommendations. With early disease prediction and timely seasonal alerts, GROWZ aims to minimize crop losses and aid in effective farming practices. The system will be user-friendly, supporting multiple languages, and continually seeking user feedback for continuous improvement and enhanced agriculturalproductivity.
Users	1.Farmers 2. Agricultural Experts 3. Agricultural Researchers
Functional Requirements	F1:User Registration and Login : The system should allow users to register and create accounts. Users should be able to login with their credentials. F2: Language Selection: This makes the system accessible to users from different linguistic backgrounds and improves the user experience significantly. F3: Location-Based Crop Recommendation: Location-based crop recommendation is a feature that provides personalized crop suggestions based on a user's geographical location. This feature leverages Geographic Information System (GIS) data and other relevant information specific to a user's location to offer suitable crop recommendations.

	F4: Soil Analysis and Recommendation: It interprets the data from soil tests to recommend the most suitable crops and amendments for optimum plant growth. F5: Market Demand Insights Prediction: Market Demand Insights is a feature in a crop recommendation system that provides valuable information to farmers about the market demand for various crops. This can guide their decisions on what to plant and when to harvest for maximum profitability F6: Fertilizers Recommendation : Fertilizer Recommendation is an essential feature in a crop recommendation system. It offers suggestions on appropriate types of fertilizers, quantities, and application timing, based on the crop type, soil composition, and other factors. F7: Yield Prediction : Yield Prediction is a feature in a crop recommendation system that uses various data points and predictive models to estimate the quantity of crop that a farmer can expect to harvest under given conditions. It is a crucial tool for farmers as it helps them plan their selling strategies, estimate profits, and manage resources efficiently. F8:Plant Disease Prediction : Plant Disease Prediction is a feature in a crop recommendation system that helps in the early detection and management of plant diseases. It uses various data and machine learning algorithms to predict potential disease threats and helps farmers take preventive actions. F9: Seasonal Alerts: Seasonal Alerts is a feature in a crop recommendation system that sends out timely notifications about various seasonal factors and events that could affect crop growth and yield. This feature enables farmers to plan and take appropriate actions in response to the changing seasons. F10: Feedback System: Feedback System in a crop recommendation system is a feature that allows users to provide feedback about their experience with the system, its accuracy, and its effectiveness. This can be crucial for continuously improving the system and ensuring it meets users' needs effectively.

Non-Functional Requirements	**F**1:Performance: This involves how quickly and efficiently the system can process user requests and provide accurate recommendations. To deliver good performance, the system must be well-optimized, with efficient algorithms for data processing and prediction, fast databases for storing and retrieving data, and a responsive user interface. F2:Scalability: As the number of users grows, the system should be able to handle the increased load without a decline in performance. This could involve using cloud-based servers that can be easily scaled up or down, or designing the system architecture to allow for distributed processing of tasks. F3:Security: The system must protect user data and system data from unauthorized access and cyber threats. This could involve techniques like encryption of data, secure user authentication methods, regular security audits, and adhering to best practices in secure coding. F4:Reliability and Availability: The system should consistently function correctly and be available whenever users need to access it. This involves robust software design, comprehensive testing to identify and fix bugs, and redundancy in the system architecture to ensure uptime even when parts of the system fail. F5:Data Backup and Recovery: Regular backups should be made of all important data to protect against data loss in the event of a system failure or data corruption. If something goes wrong, there should be a process in place for recovering lost data and restoring the system to normal operation. F6:Data Privacy and Compliance: The system should adhere to all relevant data protection regulations and respect user privacy. This might involve anonymizing collected data, obtaining informed consent from users about data collection and use, and providing transparency about how user data is used and protected. F7:Error Handling and Logging: The system should be able to handle unexpected issues gracefully, providing informative error messages to users and not crashing or losing data. Errors should be logged for further investigation and to aid in debugging and improving the system.

	F8:Compatibility: The system should be compatible with various devices, operating systems, and web browsers that farmers might use. This could involve using responsive web design to ensure the user interface works well on different screen sizes and testing the system thoroughly on various platforms F9: Backup and Disaster Recovery: In addition to regular data backups, the system should have a disaster recovery plan in place. This involves preparing for potential disaster scenarios, such as a major system failure, cyber attack, or natural disaster, and having a plan for quickly recovering the system and its data in such an event.
Software Requirements:	**Software Requirements:** 1.Frameworks : TensorFlow or PyTorch 2.Library : Numpy,Pandas,Seaborn,Sklearn 3.IDE : Andriod Studio 4.Version Control System : Git 5.User Interface Tools : Figma 6.Computer Vision Libraries : Open CV 7.Programming Languages : XML,Java 8.Cloud Based Platform : FireBase **Hardware Requirements:** 1.Operating System: Andriod or IOS 2. Memory (RAM): 4 GB or more 3. Storage (Internal Memory): 100 MB or more 4. Display: 720x1280 pixels or more 5. Storage:256 GB SSD/500 GB HDD or more

Project Guide **HOD**

(K.Balakrishna) (K.Suresh Babu)