**APPLIED DATABASE TECHNOLOGIES**

**CROP DATA ANALYSIS**

**PHASE 4 REPORT**

**TEAM NUMBER**: 15

**TEAM MEMBERS**:

STEVE MENDIS COLLIN

MEGHANA CHAKRAVARTHY MAHADASYAM

HARSHITHA REDDY GARLAPATI

**SECTION 1**

**APPLICATION URL:**

We have hosted our complete application on render.ik. Both frontend and backend have been separately hosted on render.com and below is the application URL:

<https://adt-frontend.onrender.com/>

**GITHUB LINK:**

We have updated our complete source code on github.iu.edu. Below is the link to our source code:

<https://github.iu.edu/smendis/crop_data_analysis>

**SECTION 2**

**PROJECT SUMMARY**:

This project aims to create a comprehensive crop production database for India, covering four major crop seasons from 1997 to 2023. By querying the database with region-specific information, the system will provide farmers with recommendations on the most suitable crops for their region. The system will also allow for the addition, updating, and deletion of data records, as well as the visualization of data based on the region. This project will help farmers make informed decisions about crop selection and increase crop yields in India.

**OBJECTIVE**:

India's economy is based on agriculture. Even so, the industry has several difficulties, such as issues with agricultural production, reduced productivity, and environmental degradation. There is a need for data-driven solutions that can guide policy and decision-making to solve these issues. The project's objective is to develop a reliable database of information on the nation's crop production. The database would be made to gather and arrange information on crop production from a variety of sources, such as government reports, surveys, and other relevant databases. The project's goal is to give agricultural users access to information that will help them analyze crop production.

**USEFULNES:**

The project is useful because it offers agricultural users a complete and reliable resource to study crop production patterns, identify areas for improvement, and make well-informed decisions on production planning, marketing, and research and development. There are very few websites and apps that offer details about agricultural production in India,   
however they usually have limited data sets or are centered on a few crops or areas.

For instance, information on crop production in India is available on the Directorate of Economics and Statistics of Agriculture (DESA) website, but the information is constrained to certain crops and years. Due to the project's providing of a more detailed and current database that covers a wider range of crops and areas, it would differ from existing resources. The website is targeted at agricultural users, such as farmers and other firms engaged in agriculture in India. The website would help improve agricultural decision-making and encouraging the sustainable growth of agriculture in India by providing a standardized and easily accessible resource for crop production information in visualized charts.

**DATASET**

The dataset consists of information regarding the crop production statistics for India. It gives information by state and district covering different crop seasons (kharif, rabbi, summer, and autumn) from 1997 to 2023. Additionally, the dataset provides information regarding the production annually in various parts of India. By analyzing different crop production patterns in various parts of India, one can decide on which crop to grow so that it can increase agricultural productivity, and crop management practices. Additionally, food security and other sustainable practices to adopt can be inferred.

# Dataset referred from Kaggle: Crop Production Statistics – India

# Link: [**https://www.kaggle.com/datasets/nikhilmahajan29/crop-production-statistics-india**](https://www.kaggle.com/datasets/nikhilmahajan29/crop-production-statistics-india)

**ATTRIBUTES USED IN THIS PROJECT:**  
• State   
• District   
• Crop year   
• Crop   
• Season   
• Area   
• Production   
• Yield 

**TECHNICAL DESCRIPTION** **AND FUNCTIONALITIES:**

**MVC:**

**Model**: We are using Postgres as a database.

**View**: We are using React.js along with Bootstrap, CSS to control the user interface and styling.

**Controller**: We are using Flask for the back end. Using flask, we have setup database connection and would be using this to perform CRUD operations. We are using SQLalchemy to establish database connections.

1. **Data Storage:** We are using Postgres as our database. We are currently using Postgres on our local machine and would eventually deploy the database on render.ik.
2. **Frontend:** We are using React.js along with Bootstrap and CSS to control the user interface and styling.
3. **Backend:** We are using Flask for backend development. It is a python-based framework.
4. **Database connectivity:** We are using flask\_SQLalchemy for establishing the database connectivity.
5. **App Deployment:** We would be hosting both the front end and back end of our application on render.ik

The components that our application consists of are as follows:

* The landing page of our application consists of the login page that consists of username and password.
* If a new user wants to create an account, there is a Sign-Up page as well that consists of mandatory fields such as First name, Last name, username, email address, password, phone number, date of birth and gender.
* To access the application the user must be successfully logged in.
* After a successful login, the user will be navigated to the crop data page. Here the user will be able to modify and delete the records.
* Home page (Crop Data): provides the list of entries the user created in the table format. Here the user will be able to modify the entry, delete the entry.
* Upload Farmer: This shows a form to the user, using which the user will be able to upload the details related to the crop. There is a separate tab to upload details of the crop where the user needs to enter all the mandatory fields such as crop name, season, date, district, area, production, yield, rainfall, profit and year.
* Plotting and Graphs: Navigating to the Visualization tab provides us with a pictorial representation of the yield, profit and production versus crop name, by selecting the state and district.
* The Logout tab will successfully log out the user from the account and navigates back to the login page.

**SECTION 3**

**STEVE** **COLLIN MENDIS**

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| **ASSESSEMENT** | **SCALE 1 -10** |
| **TASK COMPLETION** | **10** |
| **TEAMWORK** | **10** |
| **TEAM COMMITEMENT** | **10** |
| **CONTRIBUTION** | **My role was in the backend component where I created tables, inserted data and cleaned it before inserting. Additionally, I deployed the application.** |
| **WHAT WENT WELL** | **During the project, I learned new techniques for data cleaning and insertion, such as normalizing the database.** |
| **IMPROVEMENTS** | **I could work on adding an admin portal to the application.** |
| **COMMENTS** | **Working on this project allowed me to develop my backend development skills and acquire new skillsets.** |

**MEGHANA CHAKRAVARTHY MAHADASYAM**

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| **ASSESSEMENT** | **SCALE 1 -10** |
| **TASK COMPLETION** | **10** |
| **TEAMWORK** | **10** |
| **TEAM COMMITEMENT** | **10** |
| **CONTRIBUTION** | **Worked in the front-end development and integration with the backend** |
| **WHAT WENT WELL** | **Was able to turn in all the key features before the deadlines.** |
| **IMPROVEMENTS** | **UI can be more enhanced** |
| **COMMENTS** | **While working on this project I got a chance to learn about front-end development and how to resolve complex issues.** |

**HARSHITHA** **REDDY GARLAPATI**

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| **ASSESSEMENT** | **SCALE 1 -10** |
| **TASK COMPLETION** | **10** |
| **TEAMWORK** | **10** |
| **TEAM COMMITEMENT** | **10** |
| **CONTRIBUTION** | **Major contribution was made to the front-end development. Helped in developing crop data page, visualization, login, sign up pages. In addition to this, I worked on integrating frontend with backend.** |
| **WHAT WENT WELL** | **We have selected an interesting project theme and implemented all the features successfully on time.** |
| **IMPROVEMENTS** | **We could have worked on building a better user interface and more dynamic visualizations.** |
| **COMMENTS** | **Everyone in the team contributed equally and we had great coordination among us. Especially using react to create visualizations was exciting. Overall, working on the project was a great learning experience.** |