Project Report Format

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1.INTRODUCTION

1.1 PROJECT OVERVIEW

Agriculture is important for human survival because it serves the basic need. A well-known fact that the majority of population (≥55%) in India is into agriculture. Due to variations in climatic conditions, there exist bottlenecks for increasing the crop production in India. It has become challenging task to achieve desired targets in Agri based crop yield. Various factors are to be considered which have direct impact on the production, productivity of the crops. Crop yield prediction is one of the important factors in agriculture practices. Farmers need information regarding crop yield before sowing seeds in their fields to achieve enhanced crop yield. The use of technology in agriculture has increased in recent year and data analytics is one such trend that has penetrated into the agriculture field. The main challenge in using big data in agriculture is identification of effectiveness of big data analytics. Efforts are going on to understand how big data analytics can agriculture productivity.

1.2 PURPOSE

Farmers require accurate yield estimates for a number of reasons:

- crop insurance purposes
- delivery estimates
- planning harvest and
- storage requirements.

2.LITERATURE SURVEY

a. **Ramesh, D., and VishnuVardhan, B.,Agrarian et.al [2015]** discussed a several subdivision in India is facing rigorous problem to make the most of the crop productivity. More than 60 out of a hundred the crop still depends on monsoon rainfall. Current growths in Information Technology for agriculture field have developed an interesting research area to forecast the crop yield. The problematic of yield prediction is a major problem that remains to be solved based on accessible data. Data mining methods are the better selections for this purpose. Different Data Mining methods are used and evaluated in agriculture for approximating the upcoming year's crop production. This paper presents a brief analysis of crop yield prediction using Multiple Linear Regression (MLR) method and Density based clustering technique for the particular region i.e. East Godavari district of Andhra Pradesh in India. In this paper an effort is made in command to know the region precise crop yield analysis and it is processed by applying both Multiple Linear Regression method and Density-based clustering method. These models were experimented in respect of all the districts of Andhra Pradesh, then the procedure of evaluation is passed out with only East Godavari district of Andhra Pradesh in India.

b. **Rajshekhar Borate etc.al [2016]** describes and gave the details us for list of used methods, In India there are dissimilar agriculture crops production and those crops depends on the several kind of factors such as environmental science,

economy and also the geographical factors covering such methodologies and methods on historic yield of dissimilar crops, it is possible to get info or data which can be supportive to farmers and government organizations for creation well decisions and for make better rules which help to increased production. In this article, our effort is on application of data mining techniques which is use to extract information from the agricultural records to estimate better crop yield for main crops in main districts of India. In our project we found that the precise prediction of dissimilar specified crop yields across different districts will help to farmers of India. From this Indian farmers will plant different crops in different distr

c. **Dakshayini Patil etc.al [2017]** describes and discover the list of methods and techniques which are used Rice crop creation assumes an imperative part in sustenance safety of India, contributing over 40% to general yield generation. High harvest generation is reliant on appropriate climatic situations. Inconvenient regular atmosphere conditions, for example, low precipitation or temperature extremes can drastically diminish edit yield. Rising well plans to foresee edit efficiency in several climatic conditions can help rancher and different partners in vital basic leadership as far as agronomy and yield result. This article reports utilization of many information mining approaches will anticipate rice trim yield for Maharashtra state, India. To this review, 27 regions of Maharashtra were picked on the establishment of accessible information from openly available Indian Administration records with different atmosphere and yield limitations. This surveys the technical achievements in the field of Rice crop yield prediction.

2.1 EXISTING PROBLEM

Estimating agricultural yield prior to harvest is an Estimating agricultural yield prior to harvest is an important issue in agriculture, as the changes in crop yield from year to year influence international business, food supply, and global market prices. Also, early prediction of crop yield provides useful information to policy planners. Appropriate prediction of crop productivity is required for efficient planning of land usage and economic policy. In recent times, forecasting of crop productivity at the within-field level has increased. The most influencing factor for crop productivity is weather conditions. If the weather based prediction is made more precise, then farmers can be alerted well in advance so that the major loss can be mitigated and would be helpful for economic growth. The prediction will also aid the farmers to make decisions such as the choice of alternative crops or to discard a crop at an early stage in case of critical situations. Further, predicting crop yield can facilitate the farmers to have a better vision on cultivation of seasonal crop and its scheduling. Thus, it is necessary to simulate & predict the crop yield before cultivation for efficient crop management and expected outcome.So,this is important to build the applications based on the prediction along with climatic conditions and different types of yields etc.,

2.2 REFERENCES

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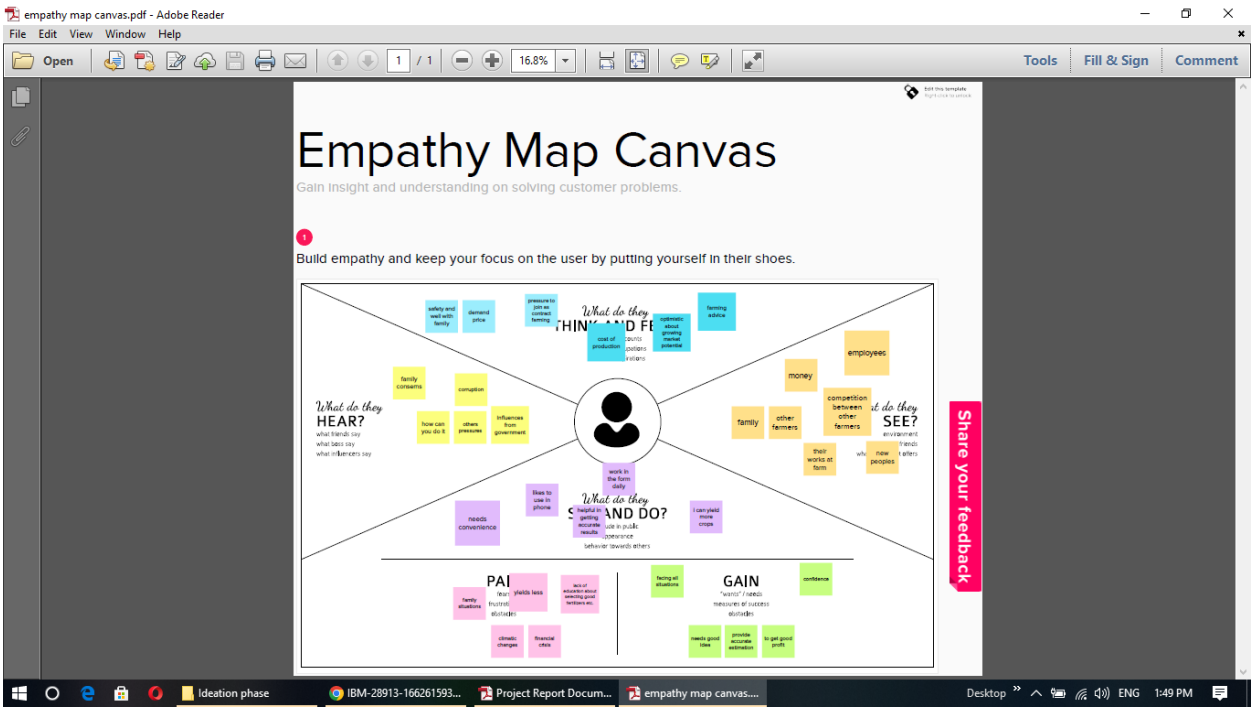
2.3 PROBLEM STATEMENT DEFINITION

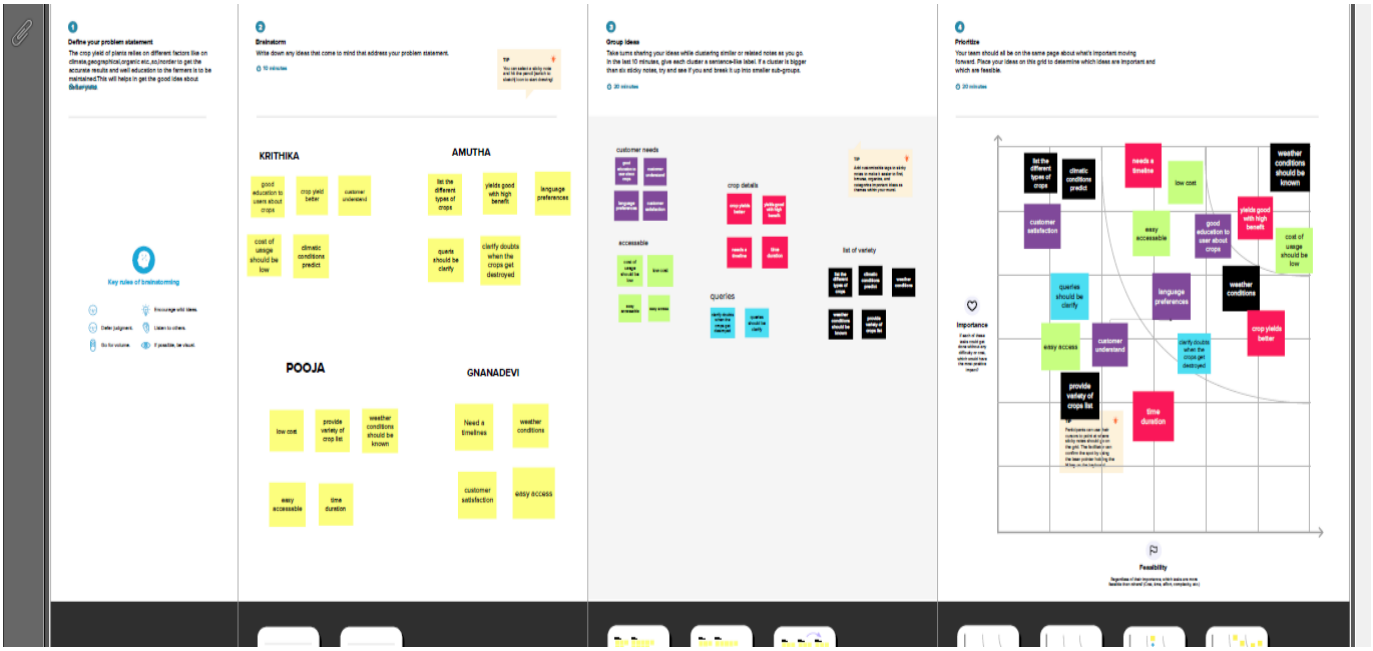
The crop yield estimation will give the clear idea for forecasting.It will be more helpful to the farmers to identify the better crop. It will provide the different types of crop variety along with the weather conditions.Farmers are facing more difficulties without any prediction.It will help them in a more useful way.

3. IDEATION & PROPOSED SOLUTION

3.1 EMPATHY MAP CANVAS



3.1 IDEATION AND BRAINSTROMING



3.2 PRPOSED SOLUTION

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	Farmers are not aware about the yield. They are worked regularly without any rest. Unpredictable changing weather conditions may damage the crop quality and quantity.
2.	Idea / Solution description	The solution to the problem is to gather the better results for the improvement. Providing the information about the different types of crops and yields and predicting the weather conditions.
3.	Novelty / Uniqueness	It helps in providing the better understanding of the crops and investment and predictable.
4.	Social Impact / Customer Satisfaction	It helps in understanding all the details about the crops by estimating the better yield.
5.	Business Model (Revenue Model)	This can be accessed through the internet by everyone at anywhere. They can be more understandable and easy to learn.
6.	Scalability of the Solution	Developing the application with different varieties of crops with image representation.

3.4 PROBLEM SOLUTION FIT

4. REQUIREMENT ANALYSIS

4.1 FUNCTIONAL REQUIREMENT

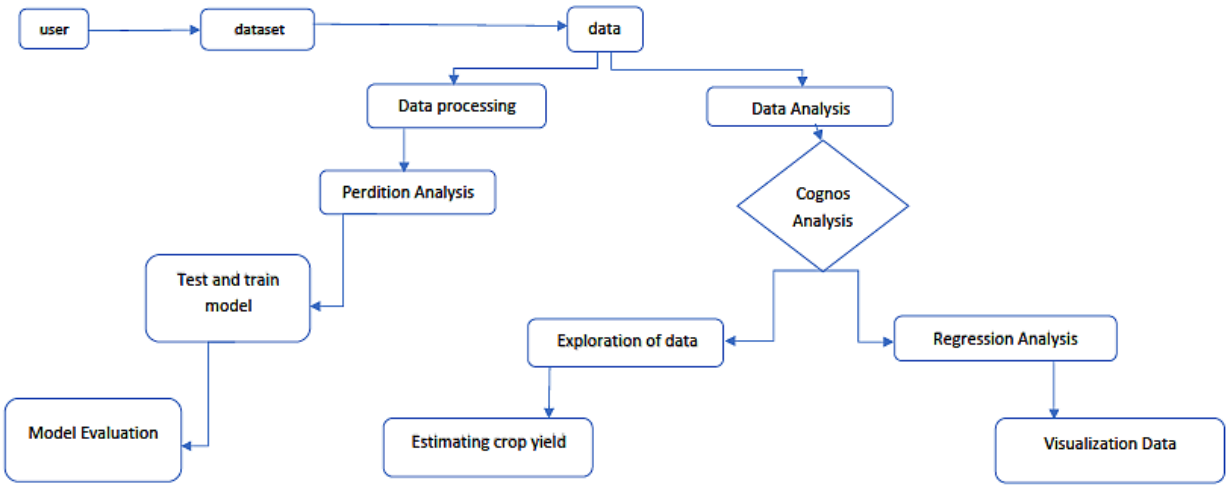
FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	User Registration	➢ Registers a new user through registration form or mail .
FR-2	User Confirmation	➢ Confirmation through Email or OTP.
FR-3	Data collection	➢ Data collection. Relevant data is gathered from operational systems, data warehouses, data lakes and other data sources. • Data discovery and profiling. • Data cleansing. • Data structuring. • Data transformation and enrichment. • Data validation and publishing.
FR-4	Data Pre-processing	➢ Data preprocessing a component of data preparation, describes any type of processing performed on raw data to prepare it for another data processing procedure. It has traditionally been an important preliminary step for the data mining process.
FR-5	Model Evaluation	➢ Model evaluation is the process of using different evaluation metrics to understand a machine learning model's performance, as well as its strengths and weaknesses. Model evaluation is important to assess the efficacy of a model during initial research phases, and it also plays a role in model monitoring
FR-6	Prediction Output	➢ Predictive analytics is the process of using data analytics to make predictions based on data. This process uses data along with analysis, statistics, and machine learning techniques to create a predictive model for forecasting future events.

4.2 NON FUNCTIONAL REQUIREMENTS

NFR No.	Non-Functional Requirement	Description
NFR-1	**Usability**	➢ It helps the farmers to monitor the health of the crops in real time, create predictive analysis related to future yield.
NFR-2	**Security**	➢ Data security functions to prevent data breaches, reduce risk of data exposure and ensure the ongoing safe and secure use of private data by minimizing exposure risk.
NFR-3	**Reliability**	➢ The reliability of the data determines whether businesses can make good decisions or not. If the data is unreliable it is useless to the organizations
NFR-4	**Performance**	➢ Regularly evaluating the performance of the organization can help us to understand how much progress we're making towards our goal. A performance analysis is a tool you can use to check important metrics of crop yield for very month or year and make plans for adjustment and improvement.
NFR-5	**Availability**	➢ Data should be available for access at anytime from anywhere.
NFR-6	**Scalability**	➢ The software should be flexible and other developers must be able to improve its capabilities.

5. PROJECT DESIGN

5.1 DATA FLOW DIAGRAMS



5.2 SOLUTION AND TECHNICAL ARCHITECTURE

Example: Order processing during pandemics for offline mode

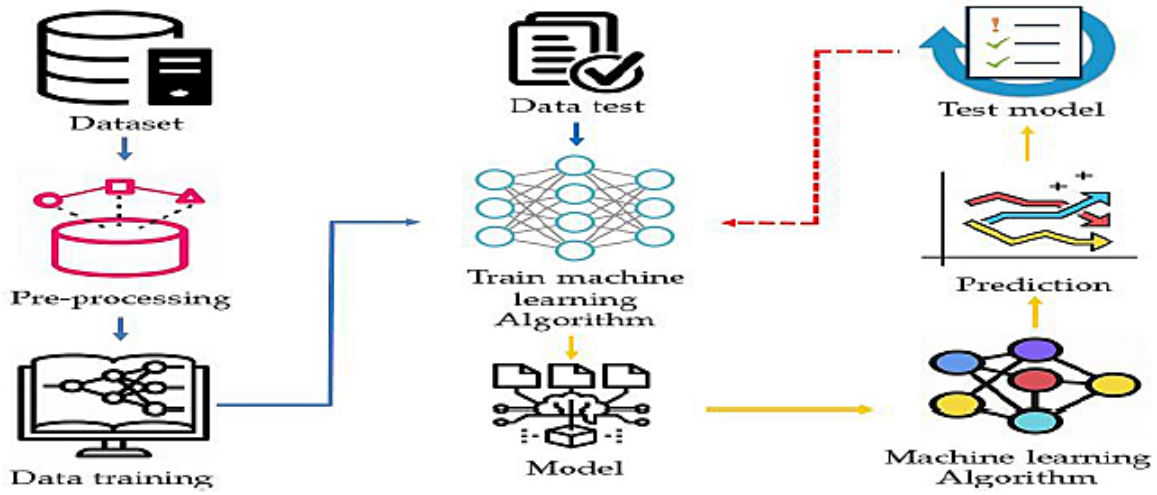


Table-1 : Components & Technologies:

S.No	Component	Description	Technology
1.	User Interface	How user interacts with application e.g. Web UI, Mobile App, Chatbot etc.	Data Set
2.	Application Logic-1	Logic for a process in the application	Python
3.	Application Logic-2	Logic for a process in the application	IBM Watson STT service
4.	Application Logic-3	Logic for a process in the application	IBM Watson Assistant
5.	Database	Data Type, Configurations etc.	MySQL, NoSQL, etc.
6.	Cloud Database	Database Service on Cloud	IBM DB2, IBM Cloudant etc.
7.	File Storage	File storage requirements	IBM Block Storage or Other Storage Service or Local Filesystem
8.	External API-1	Purpose of External API used in the application	IBM Weather API, etc.
9.	External API-2	Purpose of External API used in the application	Aadhar API, etc.
10.	Machine Learning Model	Purpose of Machine Learning Model	Object Recognition Model, etc.
11.	Infrastructure (Server / Cloud)	Application Deployment on Local System / Cloud Local Server Configuration: Cloud Server Configuration :	Local, Cloud Foundry, Kubernetes, etc.

Table-2: Application Characteristics:

S.No	Characteristics	Description	Technology
1.	Open-Source Frameworks	List the open-source frameworks used	Technology of Opensource framework
2.	Security Implementations	List all the security / access controls implemented, use of firewalls etc.	e.g. SHA-256, Encryptions, IAM Controls, OWASP etc.
3.	Scalable Architecture	Justify the scalability of architecture (3 – tier, Micro-services)	Technology used
4.	Availability	Justify the availability of application (e.g. use of load balancers, distributed servers etc.)	Technology used
5.	Performance	Design consideration for the performance of the application (number of requests per sec, use of Cache, use of CDN's) etc.	Technology used

5.3 USER STORIES

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority	Release
Customer (Mobile user)	Registration	USN-1	As a user, I can register for the application by entering my email, password, and confirming my password.	I can access my account / dashboard	High	Sprint-1
		USN-2	As a user, I will receive confirmation email once I have registered for the application	I can receive confirmation email & clickconfirm	High	Sprint-1
		USN-3	As a user, I can register for the application through Facebook	I can register & access the dashboard with Facebook Login	Low	Sprint-2
		USN-4	As a user, I can register for the application through Gmail	I can register andlogin with my email	Medium	Sprint-2
	Login	USN-5	As a user, I can log into the application by entering email & password	I can use my mail id if I forget my password o reset it.	High	Sprint-2
	Dashboard	USN-6	As a user I can access the dashboard toview the required information	I can view my profile	High	Sprint-3
Customer (Web user)		USN-7	As a user I can Register/login the application and access it	I can access my account and dashboard	Medium	Sprint-3
Customer Care Executive		USN-8	Provide support system for the application owner and able to communicate with the users	Authentication is provided to access the account so no one can access without permission	High	Sprint-4
Administrator		USN-9	As a user I can take decision to improve the company	I am able to modify the dataset.	High	Sprint-4

6. PROJECT PLANNING & SCHEDULING

6.2 SPRINT PLANNING AND ESTIMATION

1	Solution Requirements	Creating the IBM Cognos for creating dashboard and data visualization charts.	22-Aug-2022	24-Aug-2022
2	Project Objectives	Prepare the project objectives	22-Aug-2022	24-Aug-2022
3	Project Flow	Prepare the project flow	22-Aug-2022	24-Aug-2022
4	IBM Cloud Account	Creating IBM cloud account	22-Aug-2022	24-Aug-2022

5	IBM Cognos Analytics	Creating IBM cognos account	22-Aug-2022	24-Aug-2022
6	Working With the Dataset	Understanding The Dataset Loading The Dataset	24-oct-2022	19-nov-2022
7	Data visualization charts	Seasons With Average Productions With Years Usage of Area And Production Top 10 States with Most Area State With Crop Production States With the Crop Production Along with Season	24-oct-2022	19-nov-2022

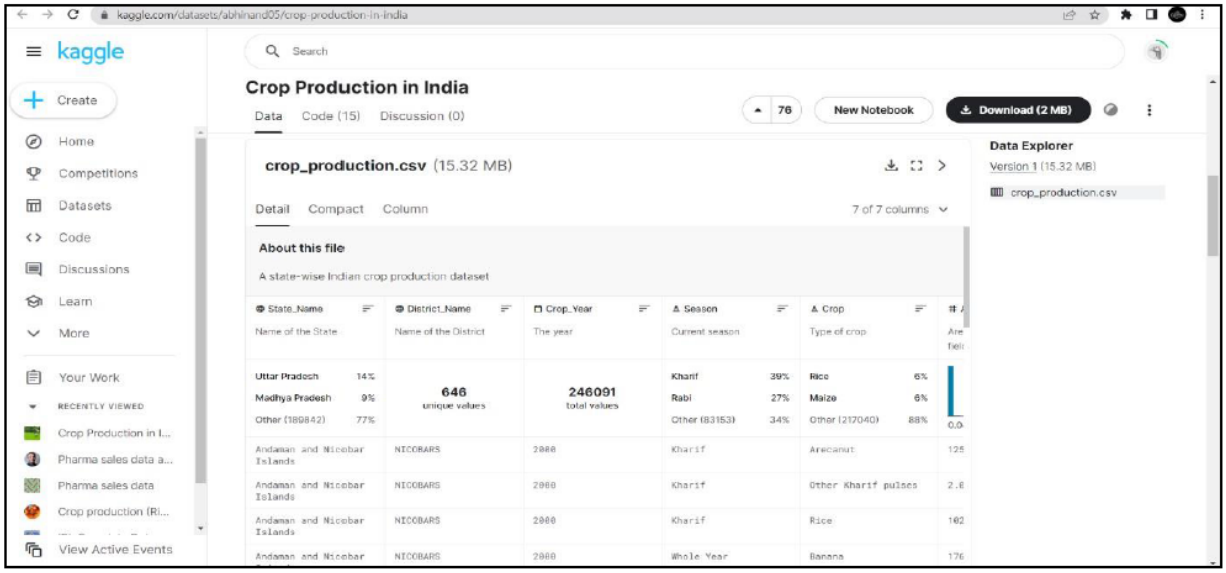
8	Creating The Dashboard	Creating The Dashboard	24-oct-2022	19-nov-2022
9	Export The Analytics	Export The Analytics	24-oct-2022	19-nov-2022
10	Ideation Phase	Literature Survey On The Selected Project & Information Gathering Prepare Empathy Map Ideation	22-Aug-2022	27-Aug-2022
11	Project Design Phase– I	Proposed Solution Problem Solution Fit Solution Architecture	22-Aug-2022	17-sep-2022
12	Project Design Phase-II	Customer Journey Functional Requirement	22-sep-2022	01-oct-2022
		Data Flow Diagrams Technology Architecture		
13	Project Planning Phase	Prepare Milestone & Activity List Sprint Delivery Plan	17-oct-2022	22-oct-2022

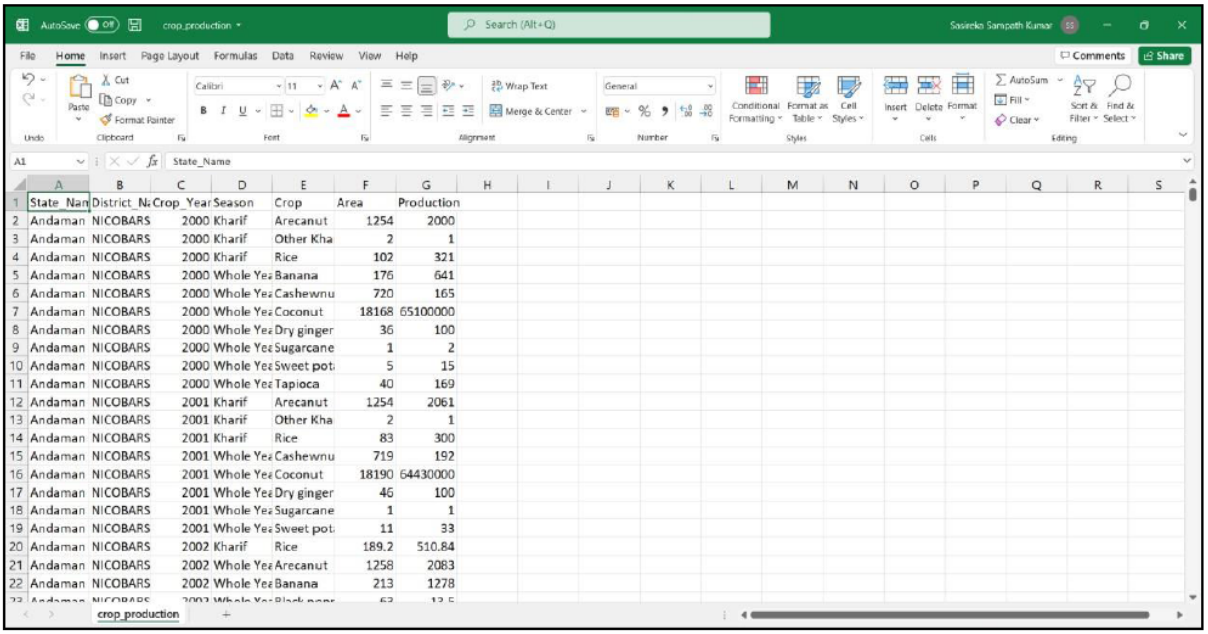
14	Project Development Phase	Project Development - Delivery of Sprint-1 Project Development - Delivery of Sprint-2 Project Development - Delivery of Sprint-3 Project Development - Delivery of Sprint-4	24-oct-2022	19-nov-2022

6.2 SPRINT DELIVERY SCHEDULE

SPRINT-1

UNDERSTANDING THE DATASET

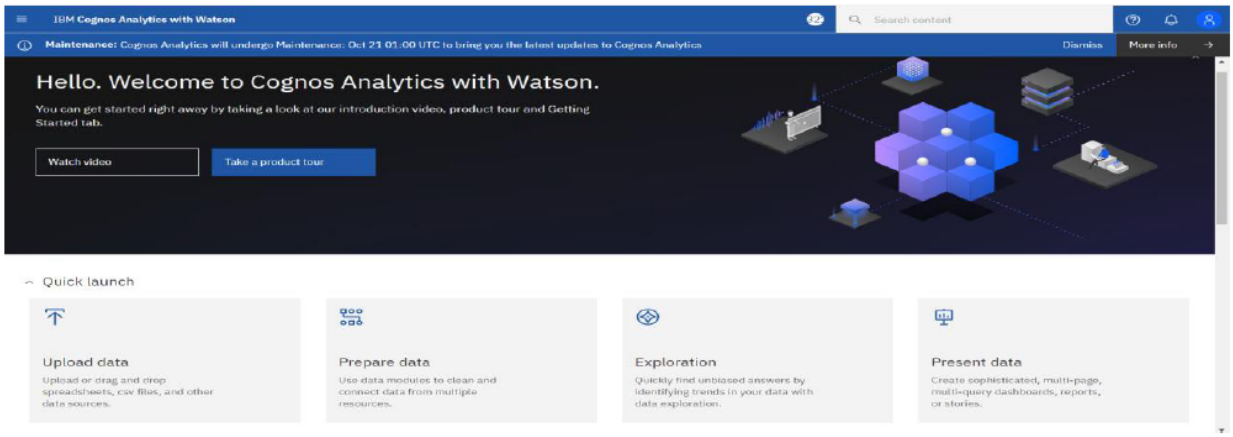




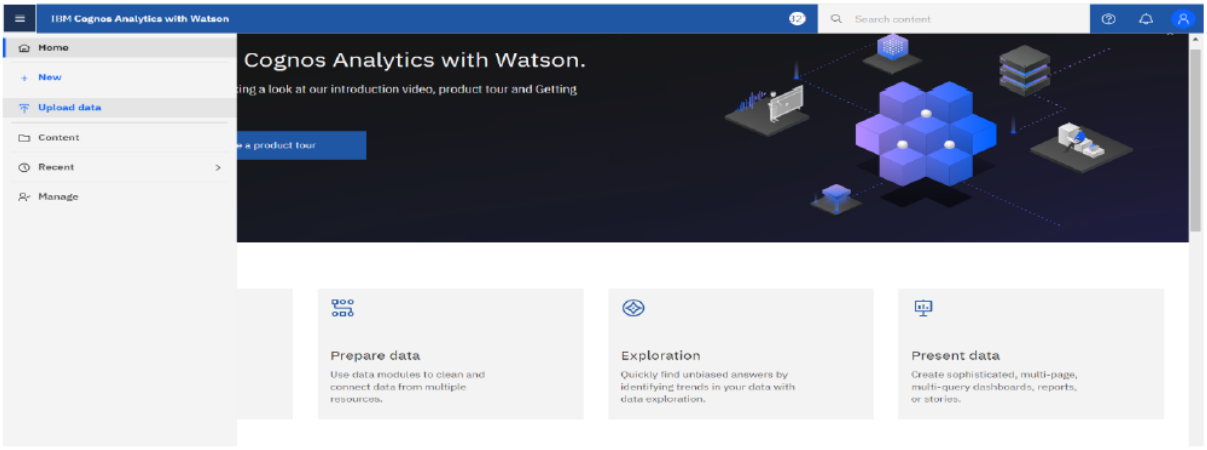
State_Nam	District_Na	Crop_Year	Season	Crop	Area	Production
Andaman	NICOBARS	2000	Kharif	Arecanut	1254	2000
Andaman	NICOBARS	2000	Kharif	Other Kha	2	1
Andaman	NICOBARS	2000	Kharif	Rice	102	321
Andaman	NICOBARS	2000	Whole Yea	Banana	176	641
Andaman	NICOBARS	2000	Whole Yea	Cashewnu	720	165
Andaman	NICOBARS	2000	Whole Yea	Coconut	18168	65100000
Andaman	NICOBARS	2000	Whole Yea	Dry ginger	36	100
Andaman	NICOBARS	2000	Whole Yea	Sugarcane	1	2
Andaman	NICOBARS	2000	Whole Yea	Sweet pot	5	15
Andaman	NICOBARS	2000	Whole Yea	Tapioca	40	169
Andaman	NICOBARS	2001	Kharif	Arecanut	1254	2061
Andaman	NICOBARS	2001	Kharif	Other Kha	2	1
Andaman	NICOBARS	2001	Kharif	Rice	83	300
Andaman	NICOBARS	2001	Whole Yea	Cashewnu	719	192
Andaman	NICOBARS	2001	Whole Yea	Coconut	18190	64430000
Andaman	NICOBARS	2001	Whole Yea	Dry ginger	46	100
Andaman	NICOBARS	2001	Whole Yea	Sugarcane	1	1
Andaman	NICOBARS	2001	Whole Yea	Sweet pot	11	33
Andaman	NICOBARS	2002	Kharif	Rice	189.2	510.84
Andaman	NICOBARS	2002	Whole Yea	Arecanut	1258	2083
Andaman	NICOBARS	2002	Whole Yea	Banana	213	1278

LOADING THE DATASET

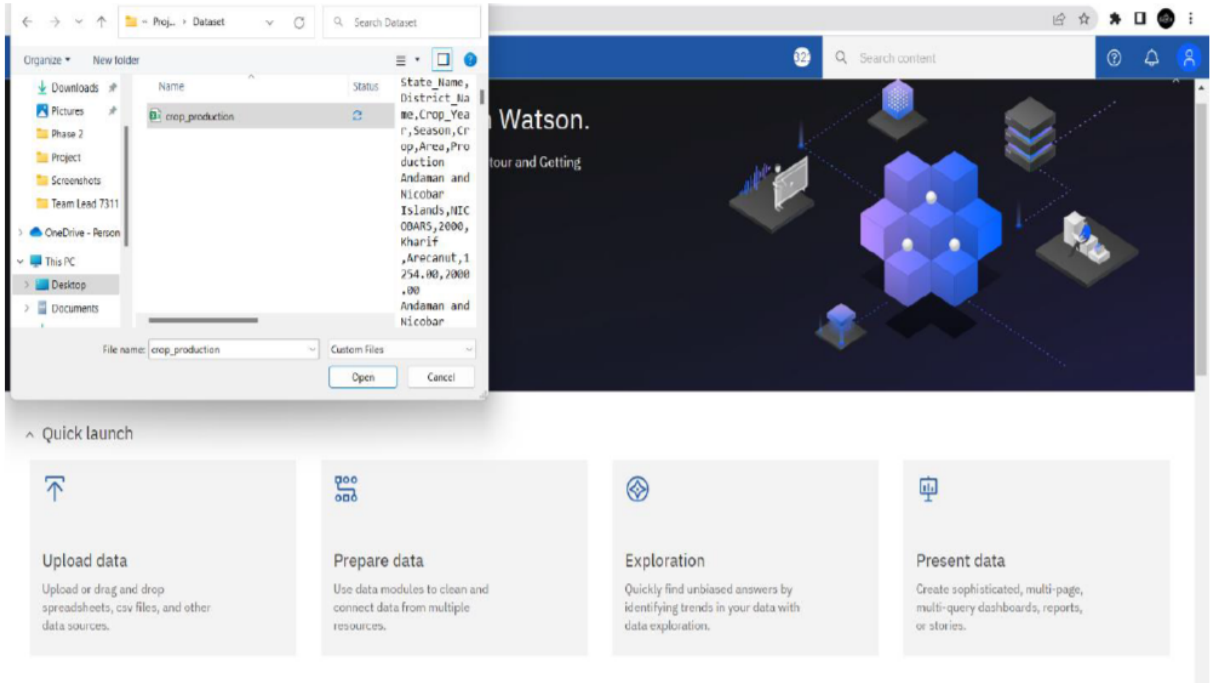
1.Login Into Ibm Cognos



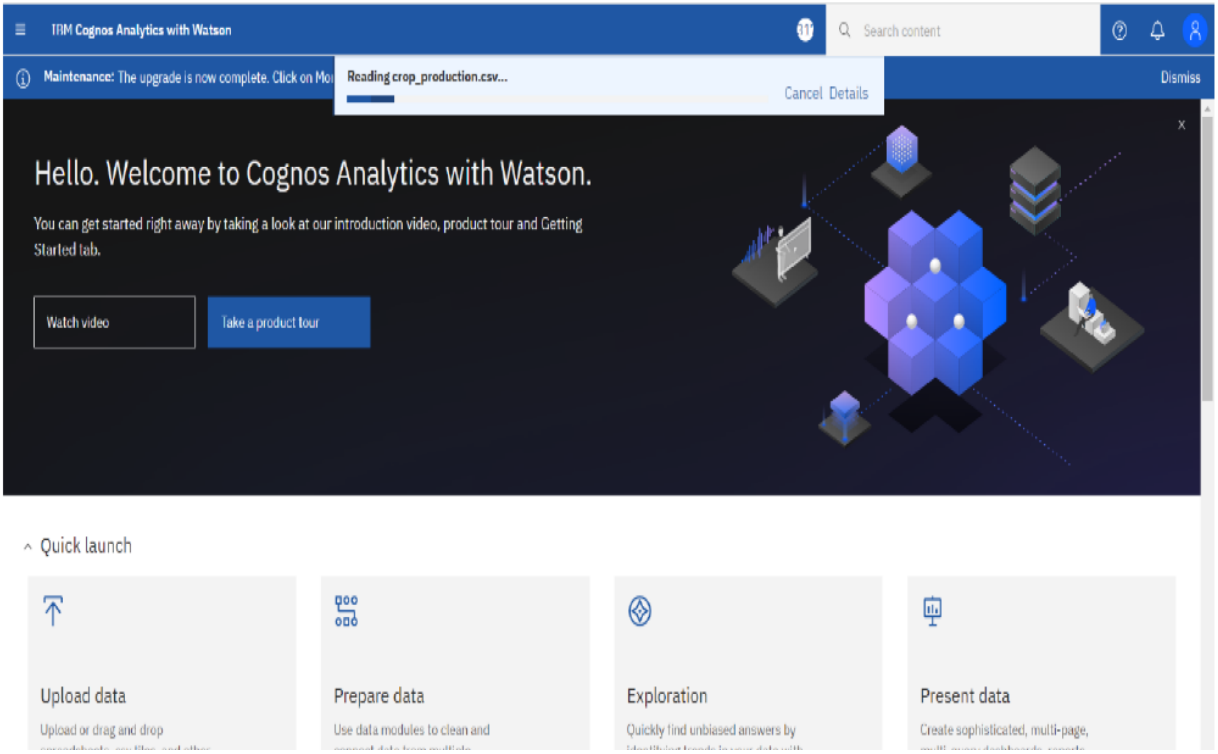
2. Go To Menu, Click On Upload Data:



3. Select The Needed Dataset:



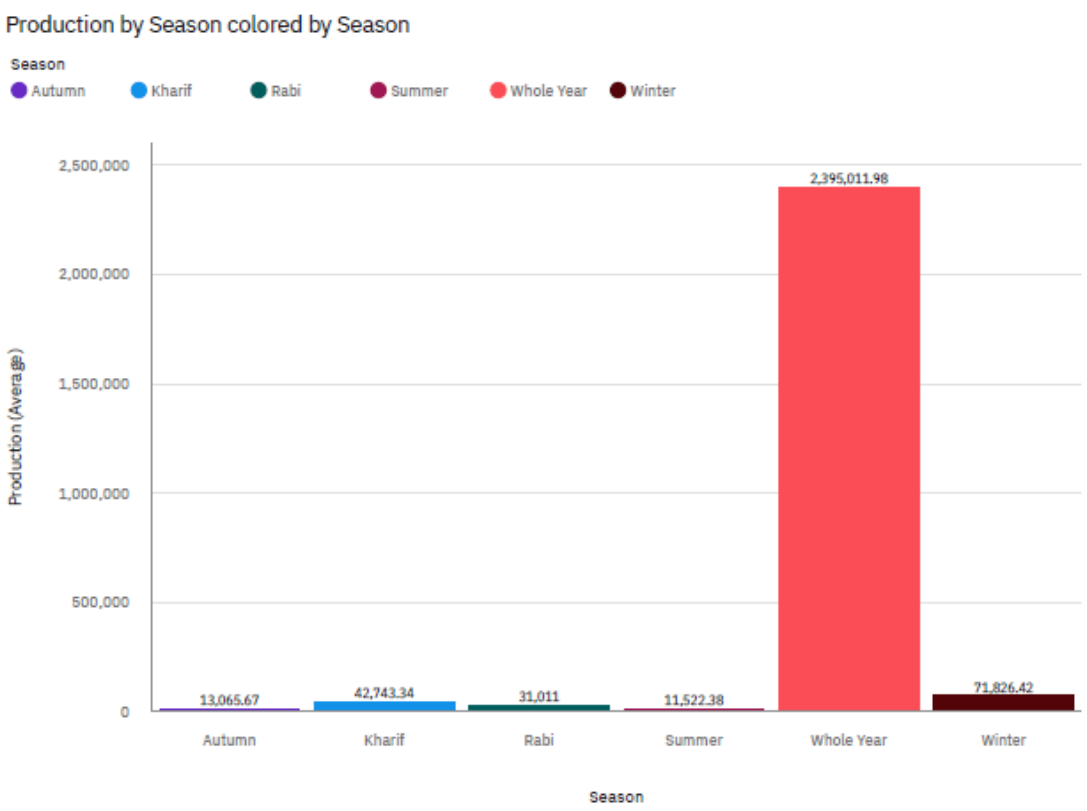
4.Click On Open And Wait Till The Dataset Is Uploaded:



SPRINT-2

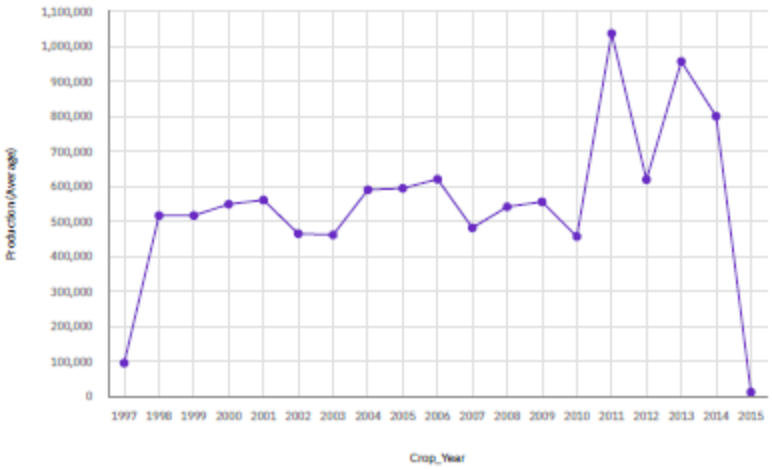
DATA VISUALIZATION CHART

different seasons with average production

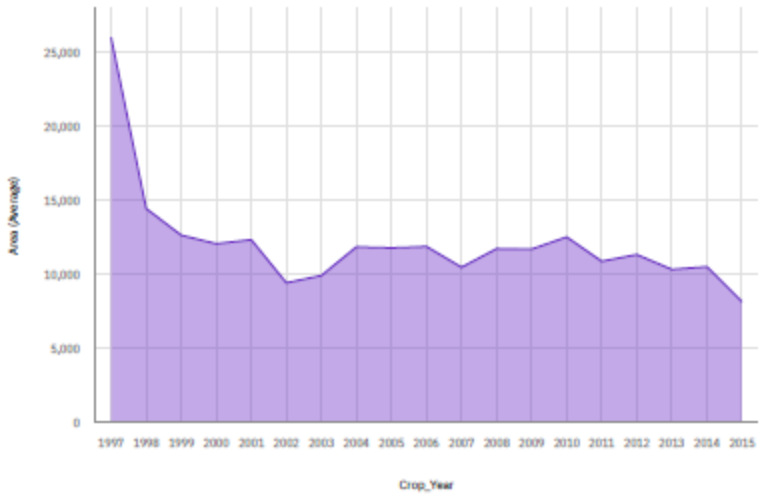


with years usage of area and production

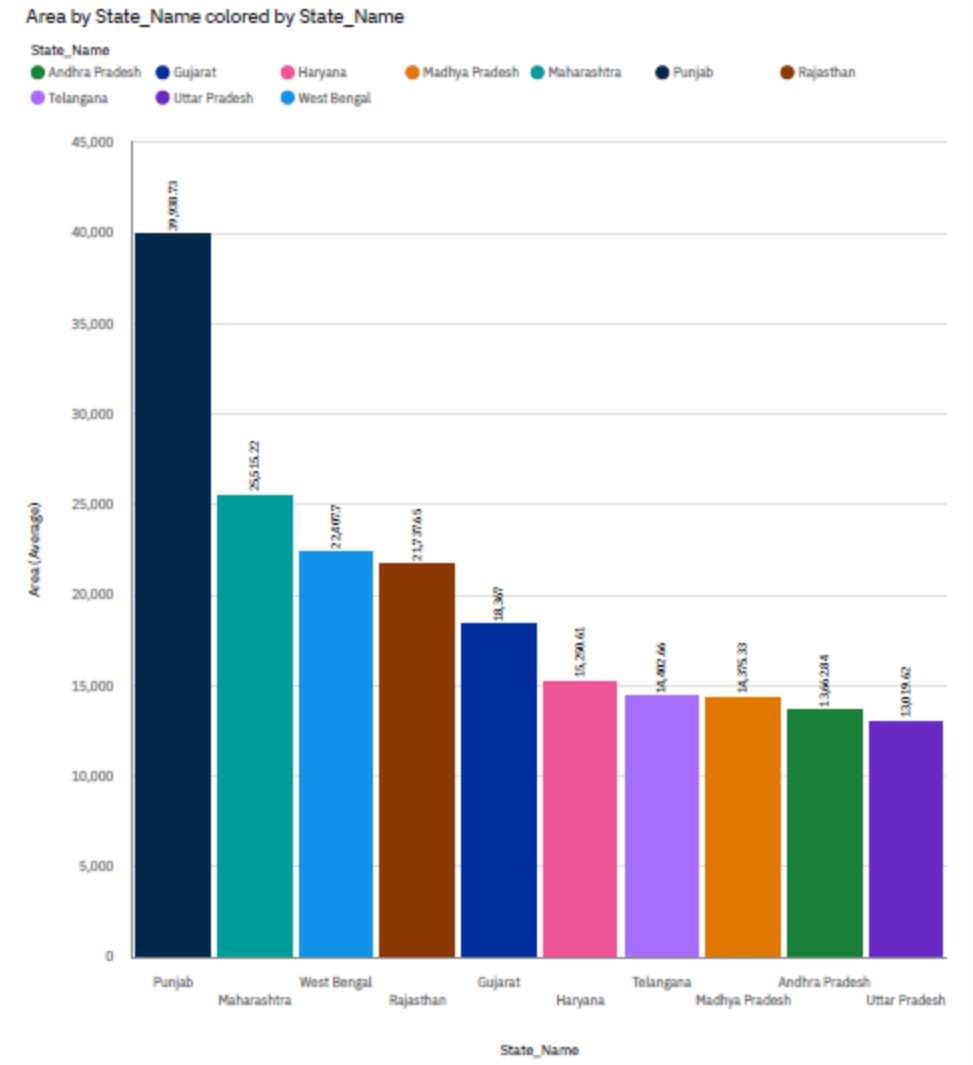
Production by Crop_Year



Area by Crop_Year

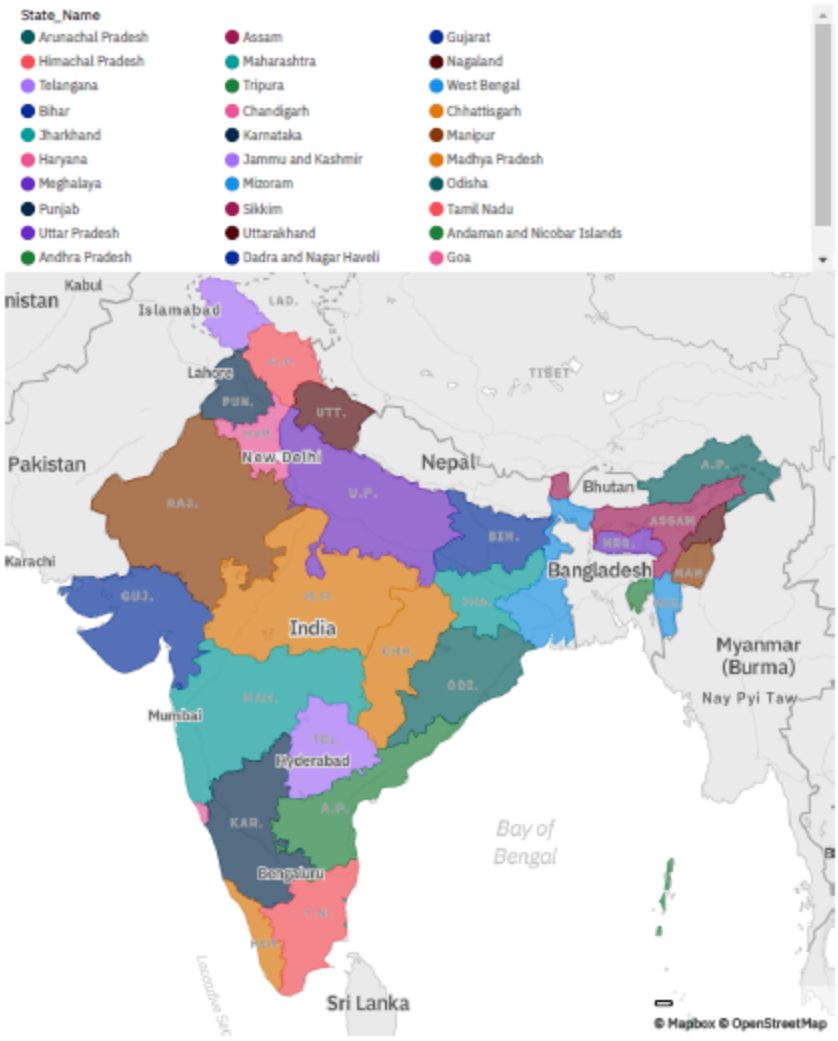


top 10 states with most area



states with crop production

State_Name for State_Name regions



table

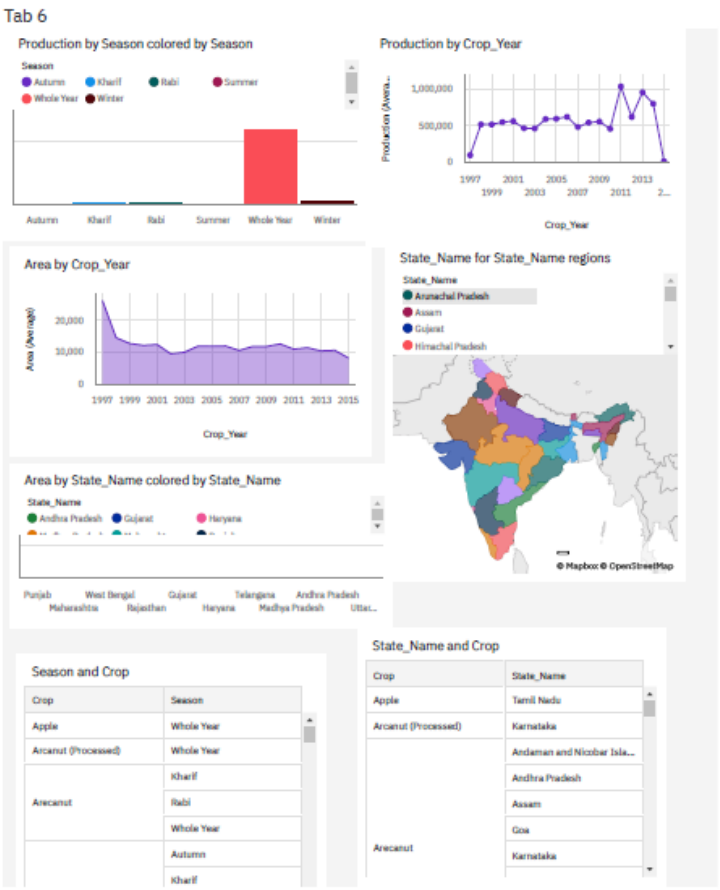
State_Name and Crop

Crop	State_Name
Apple	Tamil Nadu

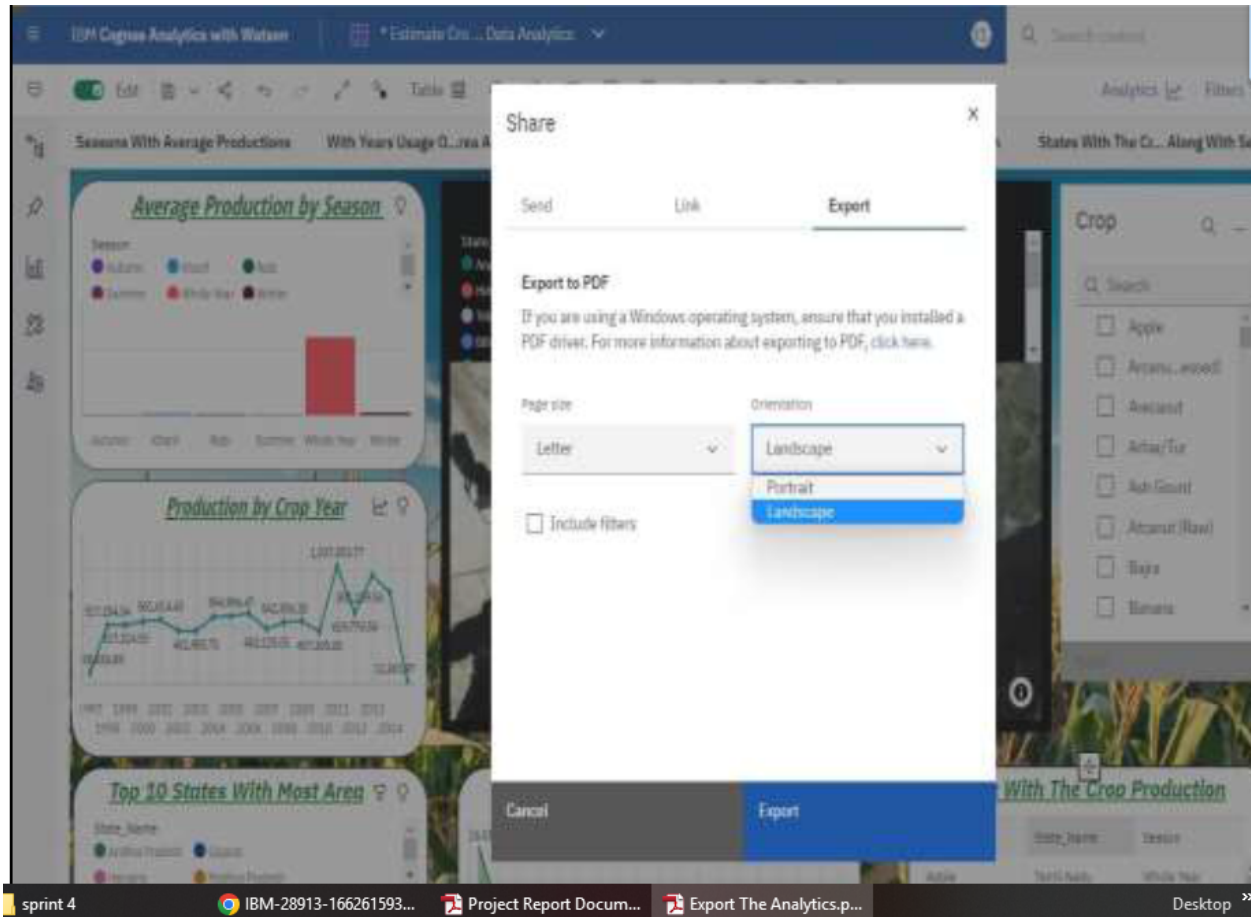
Season and Crop

Crop	Season
Apple	Whole Year

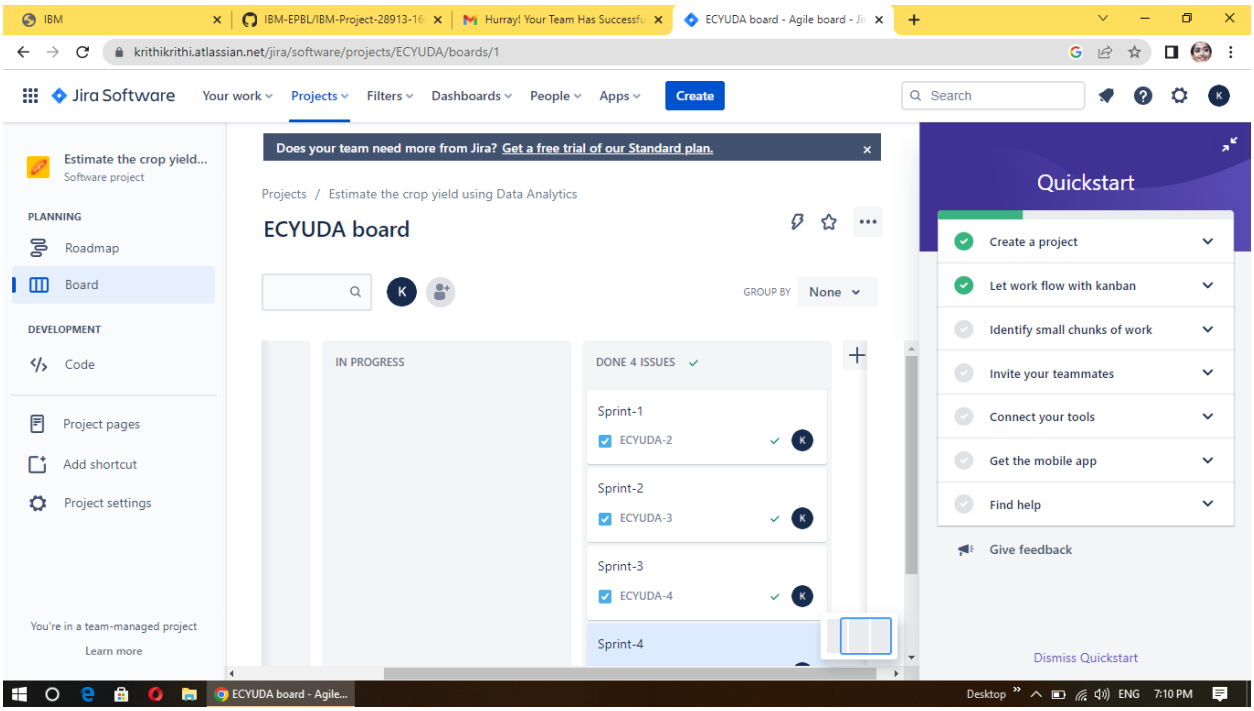
SPRINT-3
CREATING THE DASHBOARD



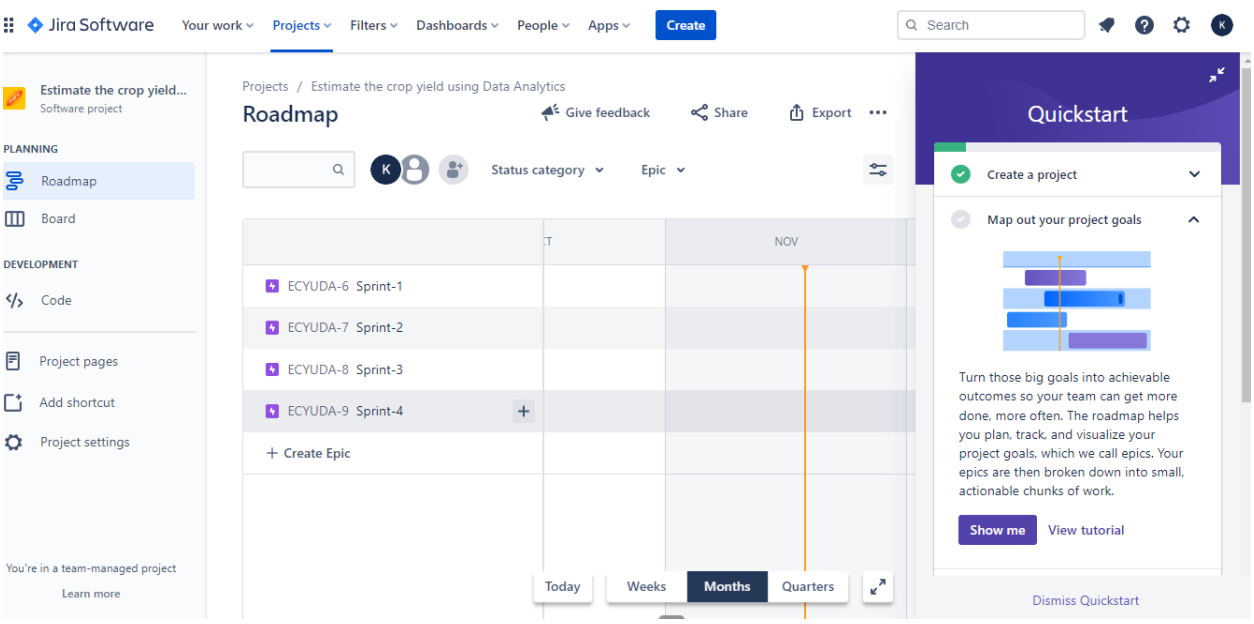
SPRINT-4


Share
Send
Link
Export
Export to PDF
If you are using a Windows operating system, ensure that you installed a PDF driver. For more information about exporting to PDF, click here.
Page size
Letter
Orientation
Landscape
Portrait
Landscape
Include filters
Cancel
Export
Average Production by Season
Production by Crop Year
Top 10 States With Most Area
Crop
With The Crop Production
sprint 4
IBM-28913-166261593...
Project Report Docum...
Export The Analytics.p...
Desktop

6.3 REPORTS FROM JIRA BOARD



ROADMAP



7. CODING & SOLUTIONING

7.1 FEATURE 1

We were creating the webpage with the login details and colourful,attracting the customers.

login form.html

```
<form action="action_page.php" method="post">
  <div class="imgcontainer">
    <img src="img_avatar2.png" alt="Avatar" class="avatar">
  </div>

  <div class="container">
    <label for="uname"><b>Username</b></label>
    <input type="text" placeholder="Enter Username" name="uname"
required>

    <label for="psw"><b>Password</b></label>
    <input type="password" placeholder="Enter Password" name="psw"
required>

    <button type="submit">Login</button>
    <label>
      <input type="checkbox" checked="checked" name="remember">
Remember me
    </label>
  </div>

  <div class="container" style="background-color:#f1f1f1">
    <button type="button" class="cancelbtn">Cancel</button>
    <span class="psw">Forgot <a href="#">password?</a></span>
  </div>
</form>
```

login form.css

```
/* Bordered form */
form {
  border: 3px solid #f1f1f1;
```

```
}

/* Full-width inputs */
input[type=text], input[type=password] {
  width: 100%;
  padding: 12px 20px;
  margin: 8px 0;
  display: inline-block;
  border: 1px solid #ccc;
  box-sizing: border-box;
}

/* Set a style for all buttons */
button {
  background-color: #04AA6D;
  color: white;
  padding: 14px 20px;
  margin: 8px 0;
  border: none;
  cursor: pointer;
  width: 100%;
}

/* Add a hover effect for buttons */
button:hover {
  opacity: 0.8;
}

/* Extra style for the cancel button (red) */
.cancelbtn {
  width: auto;
  padding: 10px 18px;
  background-color: #f44336;
}

/* Center the avatar image inside this container */
.imgcontainer {
  text-align: center;
  margin: 24px 0 12px 0;
```

```
}

/* Avatar image */
img.avatar {
  width: 40%;
  border-radius: 50%;
}

/* Add padding to containers */
.container {
  padding: 16px;
}

/* The "Forgot password" text */
span.psw {
  float: right;
  padding-top: 16px;
}

/* Change styles for span and cancel button on extra small screens */
@media screen and (max-width: 300px) {
  span.psw {
    display: block;
    float: none;
  }
  .cancelbtn {
    width: 100%;
  }
}
```

Register form

.html

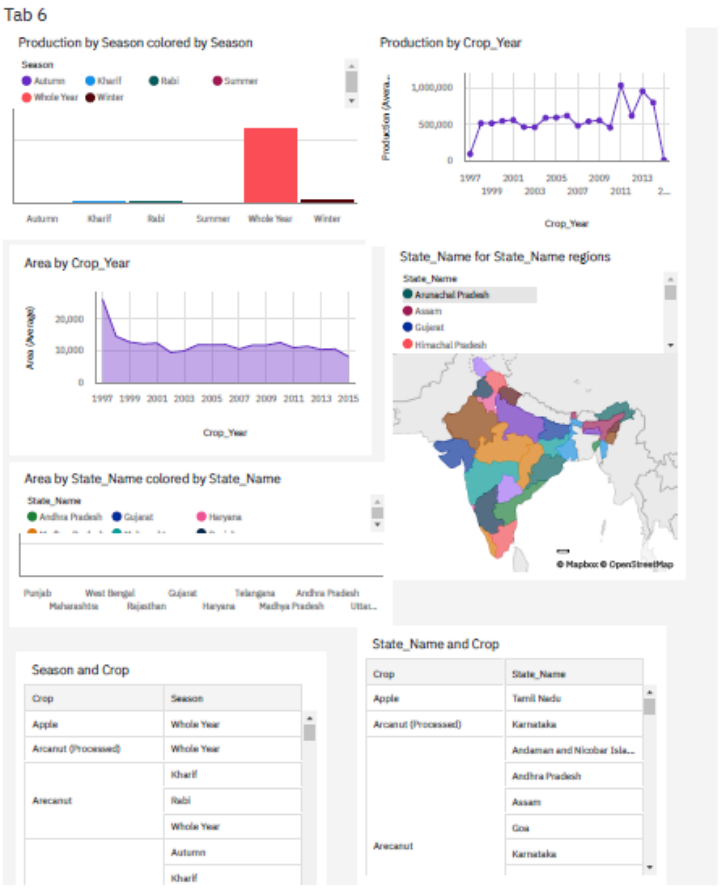
```
<form action="action_page.php">
  <div class="container">
    <h1>Register</h1>
    <p>Please fill in this form to create an account.</p>
    <hr>

    <label for="email"><b>Email</b></label>
```

```
    <input type="text" placeholder="Enter Email" name="email"
id="email" required>

    <label for="psw"><b>Password</b></label>
    <input type="password" placeholder="Enter Password" name="psw"
id="psw" required>

    <label for="psw-repeat"><b>Repeat Password</b></label>
    <input type="password" placeholder="Repeat Password" name="psw-
repeat" id="psw-repeat" required>
    <hr>

    <p>By creating an account you agree to our <a href="#">Terms &
Privacy</a>.</p>
    <button type="submit" class="registerbtn">Register</button>
  </div>

  <div class="container signin">
    <p>Already have an account? <a href="#">Sign in</a>.</p>
  </div>
</form>
```

```
.css
* {box-sizing: border-box}

/* Add padding to containers */
.container {
  padding: 16px;
}

/* Full-width input fields */
input[type=text], input[type=password] {
  width: 100%;
  padding: 15px;
  margin: 5px 0 22px 0;
  display: inline-block;
  border: none;
  background: #f1f1f1;
}
```

```
input[type=text]:focus, input[type=password]:focus {
  background-color: #ddd;
  outline: none;
}

/* Overwrite default styles of hr */
hr {
  border: 1px solid #f1f1f1;
  margin-bottom: 25px;
}

/* Set a style for the submit/register button */
.registerbtn {
  background-color: #04AA6D;
  color: white;
  padding: 16px 20px;
  margin: 8px 0;
  border: none;
  cursor: pointer;
  width: 100%;
  opacity: 0.9;
}

.registerbtn:hover {
  opacity:1;
}

/* Add a blue text color to links */
a {
  color: dodgerblue;
}

/* Set a grey background color and center the text of the "sign in"
section */
.signin {
  background-color: #f1f1f1;
  text-align: center;
}
```

7.2 FEATURE 2
CREATING DASHBOARD



8.TESTING

8.2 TEST CASES

TEST CASES	FEATURES	COMPONENT	TEST SCENARIO	EXPECTED RESULT	ACTUAL RESULT	STATUS	COMMENTS	EXECUTE BY
Sign in	functional	login page	verify user has the option to sign in	can visible	yes visible	pass	successful	V.Krithika
sign up	functional	login in	verify user can see the sign up	can visible	yes visible	pass	successful	M.Pooja, V.Amutha
forget	functional	login	verify user	yes it is	yes	pass	successful	T.Gnanadevi,

password		page	has the option to forget password	available				V.Krithika
dashboard	functional	home page	verify user can access the dashboard	datasets will be uploaded in dashboard	404 error	fail	unsuccessful	V.Amutha
types of datasets available in the dashboard	functional	dashboard	types of datasets available	weather conditions,types of crop variety	yes	pass	successful	V.Krithika, M.Pooja, T.Gnanadevi

9 . RESULTS

Thus it helps them to learn the dashboard and visualize the datasets and allowing them to understand the crop prediction and better crop yield.

10.ADVANTAGES

- It is easier to learn.
- provides varieties of crop and filtering.
- better yielding technique.
- They can be forecasted before itself.

DISADVANTAGES

- Network issues.
- Sometimes,it may fail to predict.
- It should not be used in offline mode.
- User should be learnt atleast to login and use.

11.CONCLUSION

As a result of penetration of technology into agriculture field, there is a marginal improvement in the productivity. The innovations have led to new concepts like digital agriculture, smart farming, precision agriculture etc. In the literature, it has been observed that analysis has been done on agriculture soils,hidden patterns discovery using data set related to climatic conditions and crop yields data. The activities of agriculture field are numerous like weather forecasting, soil quality assessment, seeds selection, crop yield prediction etc. In this survey, the specific activity, crop yield prediction has been surveyed and the major trends have been identified.The rice crop yield prediction has been done in the state of Maharashtra using data mining techniques in one of the works [8]. The analysis has been done using machine learning framework WEKA.

In the work carried out in [9], various algorithms applied in the assessment crop yield and mechanism for knowledge discovery has been discussed. The challenges and opportunities in the field of Big Data analytics in agriculture has been discussed in [6] with a case study of Netherlands. Fuzzy logic designs have been used in optimizing the crop yields and the same has been explained in the research work in [5]. A case study of Nebraska - USA and at a national scale for Argentina and Kenya has been done and presented in [14].The remote sensing technology for identification and measurement of the causes of yield gaps and their impact on final crop yield is presented in [15].

It can be concluded that the research in the field of agriculture with reference to using IT trends like data analytics is in its infancy. As the food is the basic need of humans, the requirement of getting the maximum yields using optimal resource will become the necessity in near future as a result of growing population. The survey outcomes indicate the need for improved techniques in crop yield analytics.

12.FUTURE SCOPE

In future it can be made much more features like offline mode and more technology based.It is better to buil