

ESTIMATE THE CROP YIELD USING DATA ANALYTICS

1.INTRODUCTION

1.1 PROJECT OVERVIEW

Analytics is the interpretation of data pattern that assist decision- making and performance improvement. Agriculture Data analytics in crop yield helps in analysing some important visualization, creating a dashboard and by going through these we will get most of the insights of Crop production in India. IBM Cognos Analytics integrates reporting, modelling, analysis, exploration, dashboards, stories, and event management so we can understand our organization's data, and make effective decisions. A dashboard helps us to monitor events or activities at a glance by providing key insights and analysis about our data on one or more pages or screens. In this project, we visualize, analyse and gain most of the insights by creating a dashboard.

1.2 PURPOSE

Yield prediction is an important agricultural problem. Every farmer is interested in knowing, how much yield he is about expect. In the past, yield prediction was performed by considering farmer's previous experience on a particular crop. The volume of data is enormous in Indian agriculture. The data when become information is highly useful for many purposes. The main purpose of yield prediction is to help the farmer to predict accordingly.

2. LITERATURE REVIEW

2.1 EXISTING PROBLEM:

Agrarian sector in India is facing rigorous problem to maximize the crop productivity. More than 60 percent of the crop depends on monsoon rainfall. Recent developments in Information Technology for agriculture field has become an interesting research area to predict the crop yield. The problem of yield prediction is a major problem that remains to be solved based on available data. Data Mining techniques are the better choices for this purpose. Different Data Mining techniques are used and evaluated in agriculture for estimating the future year's crop production. This paper presents a brief analysis of crop yield prediction using Multiple Linear Regression (MLR) technique and Density based clustering technique for the selected region.

2.2 REFERENCES:

References:

- [1] M. A. Jayaram and Netra Marad, "Fuzzy interference Systems for Crop Prediction", Journal of Intelligent Systems, 2012, 21(4), pp.363-3720.6
- [2] P. Vindya "Agricultural Analysis for Next Generation High Tech Farming in Data Mining", Anna University, Trichy, Tamilnadu, India, 5 May 2015.
- [3] Dakshayini Patil, M .S, Shirdhonkar. Rice Crop Yield Prediction using Data Mining Techniques: An Overview. International Journal of Advanced Research in Computer Science and Software Engineering, 2017; 7(5):427-43.
- [4] David B. Lobell, The use of satellite data for crop yield gap analysis, Field Crops Research-143, 2013; 56–64.

- [5] M. Paul, S. K. Vishwakarma and A. Verma, "Analysis of Soil Behaviour and Prediction of Crop Yield Using Data Mining Approach," 2015 International Conference on Computational Intelligence and Communication Networks (CICN), 2015, pp. 766-771, doi: 10.1109/CICN.2015.156.
- [6] D Ramesh, B Vishnu Vardhan. Data Mining Techniques and Applications to Agricultural Yield Data. International Journal of Advanced Research in Computer and Communication Engineering. 2013;2(9).
- [7] Dhivya B H, Manjula R, Siva Bharathi S, Madhumathi R. A Survey on Crop Yield Prediction based on Agricultural Data, International Journal of Innovative Research in Science, Engineering and Technology. 2017; 6(3):4177-4182.
- [8] Fathima, G.N., Geetha, R., "Agriculture Crop Pattern Using Data Mining Techniques", International Journal of Advanced Research in Computer Science and Engineering, Vol. 4, Issue 5, pp.781-786, 2014.
- [9] Swarupa Rani. The Impact of Data Analytics in Crop Management based on Weather Conditions. International Journal of Engineering Technology Science and Research. 2017; 4(5):299-308.
- [10] R. Sujatha, P.Isakki Devi. A Study on Crop Yield Forecasting Using Classification Techniques, IEEE,2016.

2.3 PROBLEM STATEMENT DEFINITION

Mr.S.Ram Kumar is a 40 years old man. He had a own farmingland and do Agriculture for past 20 Years , In this 20 Years he Faced a problems in crop yield . He wants to know when he will obtain more yield also choosing right crop that can be grown in particular region on a particular season.

- He has faced huge losses for a long time.
- This problem is usually faced by most farmers.
- Mr.S.Ram Kumar needs to know the result immediately.

Who does the problem affect?	Persons who do Agriculture
What are the boundaries of the problem?	People who Grow various Crops and obtaining less yield.
What is the issue?	In agricultural aspects, if the plant is grown well and did not gave proper yield. Generally, this is due to climate conditions, soil, rainfall and temperature.
When does the issue occur?	When the crops are grown on unsuitable climatic conditions or soil yield may get reduced.
Where does the issue occur?	The issue occurs in agriculture practicing areas.
Why is it important that we fix the problem?	It is important to maximize the cropyield.

What solution to solve this issue?	A system is introduced to analyze and estimate the crop yield on a particular area and on a particular season.
What methodology used to solve the issue?	<p>Data analytics techniques can be used .</p> <p>Using the previous data right crop for right season and soil can be identified. Hence more yield can be obtained.</p>

3. IDEATION & PROPOSED SOLUTION

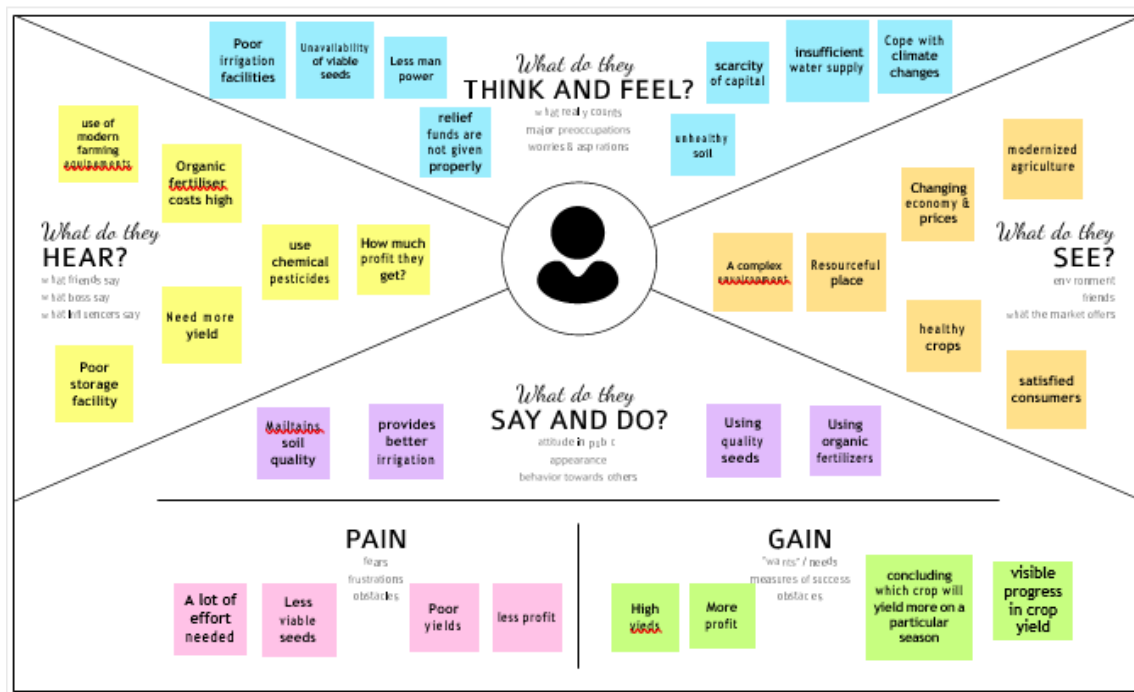
3.1 EMPATHY MAP CANVAS

Empathy Map Canvas

Gain insight and understanding on solving customer problems.


1

Build empathy and keep your focus on the user by putting yourself in their shoes.



3.2 IDEATION & BRAINSTORM


Template



Brainstorm & idea prioritization

Use this template in your own brainstorming sessions so your team can unleash their imagination and start shaping concepts even if you're not sitting in the same room.


- 10 minutes to prepare
- 1 hour to collaborate
- 2-8 people recommended



Before you collaborate


A little bit of preparation goes a long way with this session. Here's what you need to do to get going.

10 minutes




Team gathering

Define who should participate in the session and send an invite. Share relevant information or pre-work ahead.



Set the goal


Think about the problem you'll be focusing on solving in the brainstorming session.



Learn how to use the facilitation tools

Use the Facilitation Superpowers to run a happy and productive session.

[Open article](#)




Define your problem statement

What problem are you trying to solve? Frame your problem as a *How Might We* statement. This will be the focus of your brainstorm.

5 minutes







PROBLEM

How might we estimate the crop yield using data analytics?



Key rules of brainstorming

To run a smooth and productive session

 Stay in topic.	 Encourage wild ideas.
 Defer judgment.	 Listen to others.
 Go for volume.	 If possible, be visual.

2

Brainstorm

Write down any ideas that come to mind that address your problem statement.

10 minutes

TIP
You can select a sticky note and hit the pencil (switch to sketch) icon to start drawing!

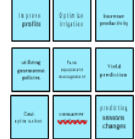
HARNI S



DEEPA.G



MAHALAKSHMI M



SHARMILA R



Group ideas

Group ideas

Take turns sharing your ideas while clustering similar or related notes as you go. Once all sticky notes have been grouped, give each cluster a sentence-like label. If a cluster is bigger than six sticky notes, try and see if you can break it up into smaller sub-groups.

20 minutes

knowledge on farming



Water supply



Climatic conditions



Farming methods



Soil & food



Seeds and Fertilizers



Financial challenges

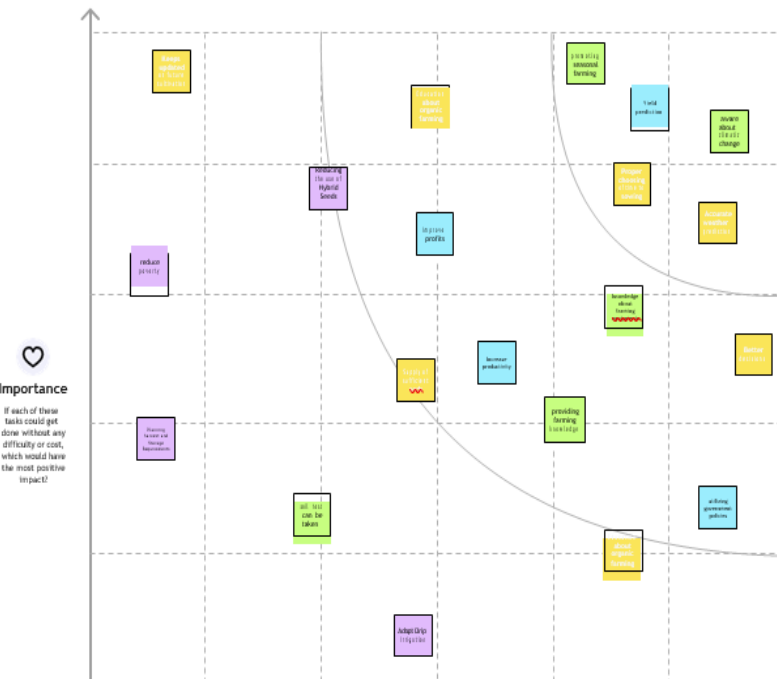


4

Prioritize

Your team should all be on the same page about what's important moving forward. Place your ideas on this grid to determine which ideas are important and which are feasible.

20 minutes



→

After you collaborate

You can export the mural as an image or pdf to share with members of your company who might find it helpful.

Quick add-ons

Share the mural
Share a view link to the mural with stakeholders to keep them in the loop about the outcomes of the session.

Export the mural
Export a copy of the mural as a PNG or PDF to attach to emails, include in slides, or save in your drive.

More ideas for you

Strategy blueprint
Define the components of a new idea or strategy.

[Open the template](#)

Customer experience journey map
Understand customer needs, motivations, and obstacles for an experience.

[Open the template](#)

Strengths, weaknesses, opportunities & threats
Identify strengths, weaknesses, opportunities, and threats (SWOT) to develop a plan.

[Open the template](#)

[Share template feedback](#)

3.3 PROPOSED SOLUTION

Proposed Solution Template:

Project team shall fill the following information in proposed solution template.

S.No	Parameter	Description
.		
1.	Problem Statement (Problem to be solved)	A farmer should be able to predict climatic conditions, decide what and when to grow, should know the overall crop yield .
2.	Idea / Solution description	Analyse the important aspects using the previous years data , creating the dashboard and through the datasets to obtain the most insights of crop production.
3.	Novelty / Uniqueness	It can be a unique and one-stop solution for a better understanding and to get a clear insight about the previous years' data on crop yield.
4.	Social Impact / Customer Satisfaction	It is available to everyone who needs help and assistance. This is a simple approach and easy to understand.
5.	Business Model (Revenue Model)	A profit can be made by promoting the solution as an easily available mobile application for everyone to access it and benefit out of it.
6.	Scalability of the Solution	There is no issue with regards to storage of datasets. Therefore the solutions can be easily scaled to handle data needs, traffic and increased number of users.

3.4 PROBLEM SOLUTION FIT

Project Title: Estimate the Crop Yield using Data Analytics

Project Design Phase-I - Solution Fit

Team ID: PNT2022TMID41233

Define CS, fit into CC	1. CUSTOMER SEGMENT(S) CS <ul style="list-style-type: none"> ✓ Farmers who do Agriculture ✓ A person who owns or manages a farm, cultivate crops, harvest them and take care of them. 	6. CUSTOMER CONSTRAINTS CC <ul style="list-style-type: none"> ✓ Lack of education ✓ Information not received in time ✓ Unaware of Government programs ✓ Finance related problems 	5. AVAILABLE SOLUTIONS AS <ul style="list-style-type: none"> ✓ Traditional farming ✓ Harvesting at right time ✓ Sowing in right time 	Explore AS, differentiate
	2. JOBS-TO-BE-DONE / PROBLEMS J&P <ul style="list-style-type: none"> ✓ Predictive analytics related future yields from collected data. ✓ Increase productivity using precision farming. ✓ Use modern equipment and increase profits. 	9. PROBLEM ROOT CAUSE RC <ul style="list-style-type: none"> ✓ Not enough agricultural land ✓ Problem of Labor ✓ Unavailability of good seeds ✓ Less use of modern farming equipment ✓ Insufficient irrigation ✓ Unpredictable weather conditions 	BEHAVIOUR BE <ul style="list-style-type: none"> ✓ Using age-old wisdom combined with modern technological advances, farmers have a high chance of success. ✓ Accurate and timely weather data. ✓ Pay attention to the health of your soil as you prepare your fields. 	

Identify strong TR & EM	3. TRIGGERS TR <p>Farmers who enjoy a higher yield and more significant profit.</p>	10. YOUR SOLUTION SL <p>An interactive, visualization dashboard is created. A system is introduced to analyze and estimate the crop yield on a particular area on a particular session. Data analytics techniques can be used. It is important to maximize the crop yield.</p>	8. CHANNELS of BEHAVIOUR CH <ul style="list-style-type: none"> ✓ Using the previous data right crop for right season and soil can be identified. ✓ To make yield prediction and cope with climatic change. ✓ Hence more yield can be obtained. 	Identify strong TR & EM
	4. EMOTIONS: BEFORE / AFTER EM <p>Before: The rate of production is low.</p> <p>After: It saves time and energy. It increases and improves agricultural products.</p>			

4. REQUIREMENT ANALYSIS

4.1 FUNCTIONAL REQUIREMENT

Following are the functional requirements of the proposed solution.

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	User Registration	Registration through Form Registration through Gmail
FR-2	User Confirmation	Confirmation via Email Confirmation via OTP
FR-3	User Profile Update	Updating personal details Updating educational details
FR-4	User Login	Login with username and password
FR-5	User Dashboard	Performing required operations
FR-6	Project Upload	Uploading the project according to the problem statement provided

4.2 NON-FUNCTIONAL REQUIREMENT

Following are the non-functional requirements of the proposed solution.

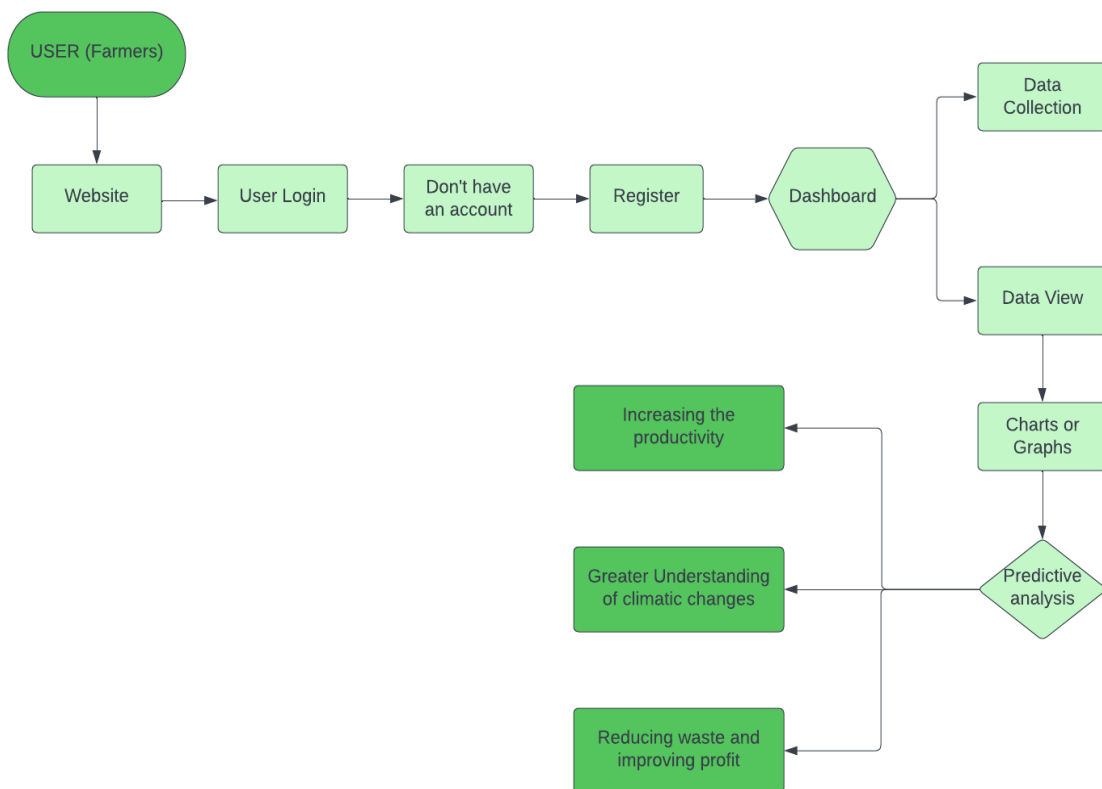
FR No.	Non-Functional Requirement	Description
NFR-1	Usability	India is one of the top countries to produce crops. As per this project we will be analyzing some important visualization, creating a dashboard and by going through these we will get most of the insightsof crop production in India.

NFR-2	Security	Data analytics has a significant relationship with a firms ability to manage data security.
NFR-3	Reliability	Farmers are now entitled with the insights that can help them predict the market condition towards the finished goods and other related variables.
NFR-4	Performance	Data analytics helps in executing the existing algorithms faster with large data sets. One of the important feature is data processing which involves the processing of raw data collections.
NFR-5	Availability	With data analytics crop yield can prediction can be done earlier even before sowing seeds which results more productivity.
NFR-6	Scalability	Automated data science and data engineering tasks. Train, test and deploy models seamlessly across multiple enterprise applications. Extend common data science capabilities across hybrid and multi-cloud environments.

5.PROJECT DESIGN

5.1 DATA FLOW DIAGRAM:

A Data Flow Diagram (DFD) is a traditional visual representation of the information flows within a system. A neat and clear DFD can depict the right amount of the system requirement graphically. It shows how data enters and leaves the system, what changes the information, and where data is stored.



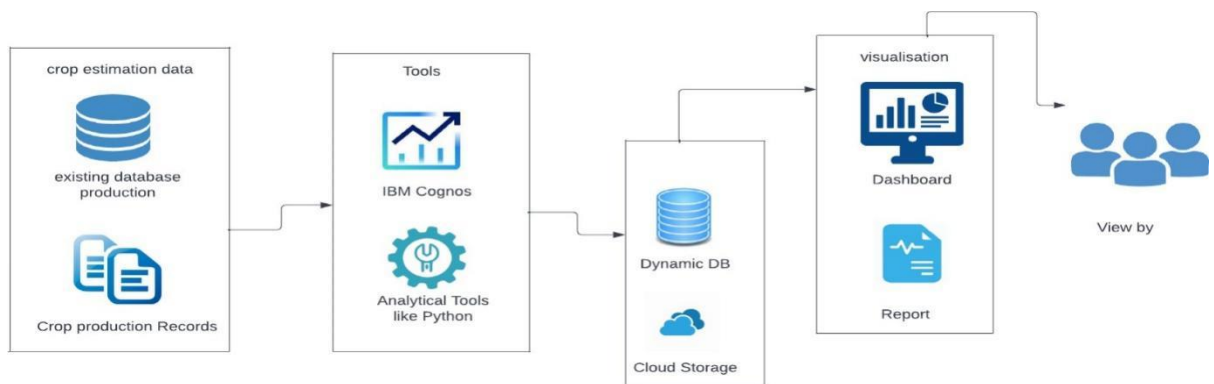
5.2 SOLUTION & TECHNICAL ARCHITECTURE

Solution Architecture:

Solution architecture is a complex process – with many sub-processes – that bridges the gap between business problems and technology solutions. Its goals are to:

- Find the best tech solution to solve existing business problems.
- Describe the structure, characteristics, behavior, and other aspects of the software to project stakeholders.
- Define features, development phases, and solution requirements.
- Provide specifications according to which the solution is defined, managed, and delivered.

Example – Solution Architecture Diagram:



Project Design Phase-II

Technology Stack(Architecture & Stack)

Technical Architecture

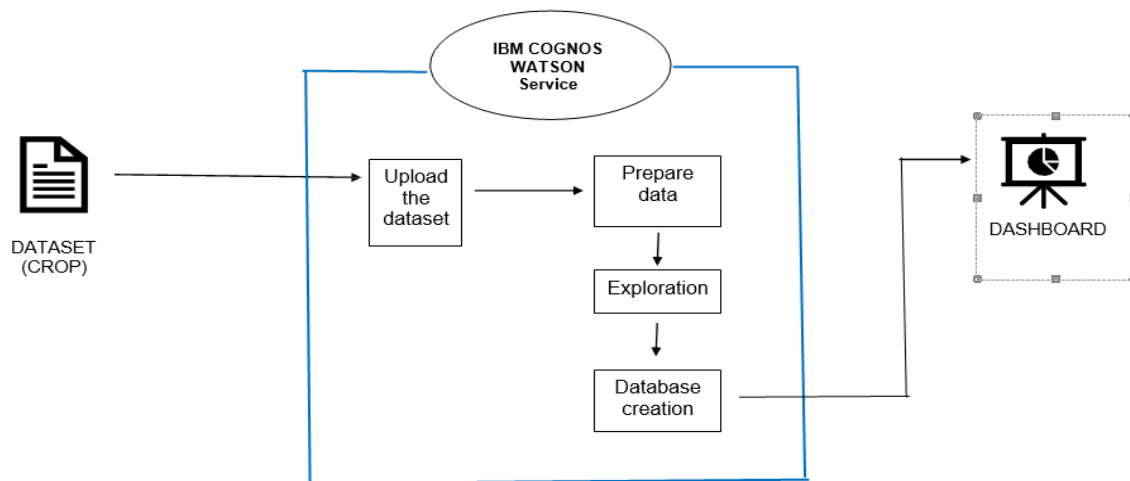


Table-1: Components & Technologies:

<u>S.No</u>	Component	Description	Technology
1.	User Interface	How user interacts with application <u>e.g.</u> WebUI, Mobile App, Chatbot etc.	HTML, CSS, JavaScript / Angular Js / React Js etc.
2.	Application Logic-1	Logic for a process in the application	Java / 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 Cognos Watson
5.	Cloud Database	Database Service on Cloud	IBM DB2, IBM Cloudant etc.
6.	File Storage	File storage requirements	IBM Block Storage or Other Storage Service or Local Filesystem

Table-2: Application Characteristics:

<u>S.No</u>	Characteristics	Description	Technology
1.	Open-Source Frameworks	List the open-source frameworks used	Technology of Opensource <u>framework</u> : Django
2.	Security Implementations	List all the security / access controls implemented,use of firewalls etc.	<u>e.g.</u> SHA-256, Encryptions, IAM Controls, OWASP etc.
3.	Scalable Architecture	Justify the scalability of architecture (3 – tier, Micro-services)	Technology <u>used</u> : 3-tier
<u>S.No</u>	Characteristics	Description	Technology
4.	Availability	Justify the availability of application	Technology <u>used</u> : <u>Eg</u> : Distributed servers
5.	Performance	Design consideration for the performance of the application	Technology <u>used</u> : IBM Cognos Watson

5.3 USER STORIES

Use the below template to list all the user stories for the product.

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority	Release
Customer (Web user)	Registration	USN-1	As a user, I can register for the website by entering my personal details and creating account using username and password.	I can access my account / dashboard	High	Sprint-1
		USN-2	As a user, After completed the registration I will receive confirmation message through my registered emailid.	I can receive confirmation email	High	Sprint-1
		USN-3	As a user, I can <u>logged</u> to my account successfully.	I can register & access the dashboard	Low	Sprint-2
	Login	USN-4	As a user, I can <u>logged</u> in my account using my username and password.	I can access the dashboard by login into the website.	High	Sprint-1
	Dashboard	USN-5	As a User, I can view and access the information in the dashboard.	I can <u>analyse</u> the current activities of crop production.	High	Sprint-1
		USN-6	As a Web User, using the website understanding the climatic changes properly and it helps in improving the crop production.	The website must work properly and <u>also</u> there should be no error into the information which is provided.		
Customer Care Executive		CCE-1	As customer care executive I will always be available for the <u>interaction with</u> the customer to clarify the queries.	An executive will note down the customers complaints and solve their problems.	High	Sprint-2

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority	Release
Administrator		ADMIN-1	As an Administrator, I will manage backup and recovery, data <u>modelling and</u> design, distributed computing, database systems, and a data security.	Administrators can evaluate, design, review and implementing a data and they are also responsible for updating and maintaining the data.	High	Sprint-2

6.PROJECT PLANNING & SCHEDULING

6.1 SPRINT PLANNING & ESTIMATION

Milestone and activity list

Team ID	PNT2022TMID41233
Project Members	Harni S, Deepa G, Mahalakshmi M, Sharmila R
Project Name	Estimate The Crop Yield Using Data Analytics
Project mentors	Industry mentor – Srikanth, Mahidhar, Mohammed Azhar Uddin Faculty mentor – Sugavaneshwari P

Activity number	Activity name	Detailed activity description	Assigned to
1	Preparation Phase	<ul style="list-style-type: none"> Access the resources (courses) in project dashboard Access the guided project workspace Create GitHub account & collaborate with Project Repository in project workspace Set-up the Laptop / Computers based on the prerequisites for each technology track 	Harni S Deepa G Mahalakshmi M Sharmila R
2	Ideation Phase		
2.1	Literature survey	Literature survey on the selected project & Information Gathering	Harni S Deepa G Mahalakshmi M Sharmila R
2.2	Define a problem statement	Prepare the list of problem statements to understand the user needs	Harni S Deepa G Mahalakshmi M Sharmila R
2.3	Empathy Map	Preparation of Empathy Map Canvas to capture the user Pains & Gains	Harni S Deepa G Mahalakshmi M Sharmila R

2.4	Brainstorm & idea prioritization	List the ideas by organizing the brainstorming session and prioritize the top 3 ideas based on the feasibility & importance	Harni S Deepa G Mahalakshmi M Sharmila R
3	Project Design Phase I		

Activity number	Activity name	Detailed activity description	Assigned to
3.1	Proposed Solution	Preparation of proposed solution document, which includes the novelty, feasibility of idea, business model, social impact, scalability of solution	Harni S Deepa G Mahalakshmi M Sharmila R
3.2	Problem Solution Fit	Prepared problem is analyzed and make effective solutions for the problem	Harni S Deepa G Mahalakshmi M Sharmila R
3.3	Solution Architecture	Prepare an architecture for solution	Harni S Deepa G Mahalakshmi M Sharmila R
4	Project Design Phase II		
4.1	Requirement Analysis	Prepare the Functional Requirement and Non- Functional Document	Harni S Deepa G Mahalakshmi M Sharmila R
4.2	Customer Journey	Preparation of customer journey maps to understand the user interactions & experiences with the application (entry to exit)	Harni S Deepa G Mahalakshmi M Sharmila R
4.3	Data Flow Diagrams	Prepare a Data Flow Diagram for Project use level 0 (Industry Standard)	Harni S Deepa G Mahalakshmi M Sharmila R
4.4	Technology Architecture	Prepare Technology Architecture of the solution	Harni S Deepa G Mahalakshmi M

			Sharmila R
5	Project Planning Phase		
5.1	Milestones & Tasks	Prepare Milestone & Activity List	Harni S Deepa G Mahalakshmi M Sharmila R
5.2	Sprint Schedules	Prepare Sprint Delivery Plan	Harni S Deepa G Mahalakshmi M Sharmila R
6	Project Development Phase		
Activity number	Activity name	Detailed activity description	
6.1	Coding & Solutioning	Sprint-1 Delivery: Develop the Code, Test and push it to GitHub.	Harni S Deepa G Mahalakshmi M Sharmila R
6.2	Acceptance Testing	Sprint-2 Delivery: Develop the Code, Test and push it to GitHub. Sprint-3 Delivery: Develop the Code, Test and push it to GitHub.	Harni S Deepa G Mahalakshmi M Sharmila R
6.3	Performance Testing	Sprint-4 Delivery: Develop the Code, Test and push it to GitHub.	Harni S Deepa G Mahalakshmi M Sharmila R

Milestone with timeline chart:



6.2 SPRINT DELIVERY SCHEDULE

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-1	Registration	USN-1	As a user, I can register for the website by entering my email, password, and confirming my password.	2	High	4 Members
Sprint-1		USN-2	As a user, I will receive confirmation email once I have registered for the website	1	High	4 Members
Sprint-2		USN-3	As a user, I can register for the website through Gmail	2	Low	4 Members
Sprint-1	Login	USN-4	As a user, I can log into the website by entering email & password	2	High	4 Members
Sprint-3	Dashboard	USN-5	As a user, I can freely use my dashboard and explore the features	2	High	4 Members
Sprint- 2		USN-6	As a user, I can use the credentials to access the resources of my website	2	High	4 Members
Sprint- 2		USN-7	Performance of Data manipulations on the website	2	High	4 Members
Sprint- 3	Visualizations	USN-8	I can create dashboards with particular datasets	2	High	4 Members
Sprint- 3		USN-9	Predictive analysis can be done	2	High	4 Members
Sprint- 4		USN-10	I can create stories with particular datasets	1	High	4 Members
Sprint- 4		USN-11	I can deliver and export reports according to the dashboards and stories created	2	High	4 Members

Sprint	Total Story Points	Duration	Sprint Start Date	Sprint End Date (Planned)	Story Points Completed (as on Planned End Date)	Sprint Release Date (Actual)
Sprint-1	20	6 Days	24 Oct 2022	29 Oct 2022	20	29 Oct 2022
Sprint-2	20	6 Days	31 Oct 2022	05 Nov 2022	20	05 Nov 2022
Sprint-3	20	6 Days	07 Nov 2022	12 Nov 2022	20	12 Nov 2022
Sprint-4	20	6 Days	14 Nov 2022	19 Nov 2022	20	19 Nov 2022

Velocity:

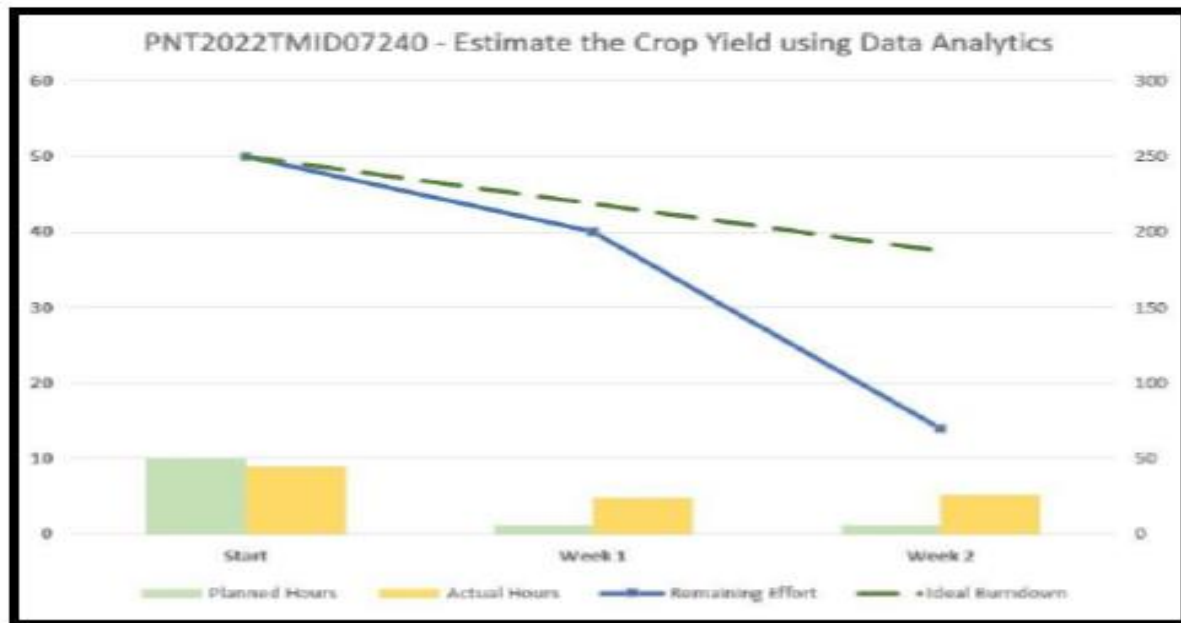
Imagine we have a 10-day sprint duration, and the velocity of the team is 20 (points per sprint). Let's calculate the team's average velocity (AV) per iteration unit (story points per day)

$$AV = \frac{\text{sprint duration}}{\text{velocity}} = \frac{20}{10} = 2$$

$$AV = \text{Sprint Duration} / \text{Velocity} = 20 / 6 = 3$$

Burndown Chart:

A burn down chart is a graphical representation of work left to do versus time. It is often used in agile software development methodologies such as Scrum. However, burn down charts can be applied to any project containing measurable progress over time.



<https://www.visual-paradigm.com/scrum/scrum-burndown-chart/>

<https://www.atlassian.com/agile/tutorials/burndown-charts>

Reference:

<https://www.atlassian.com/agile/project-management>

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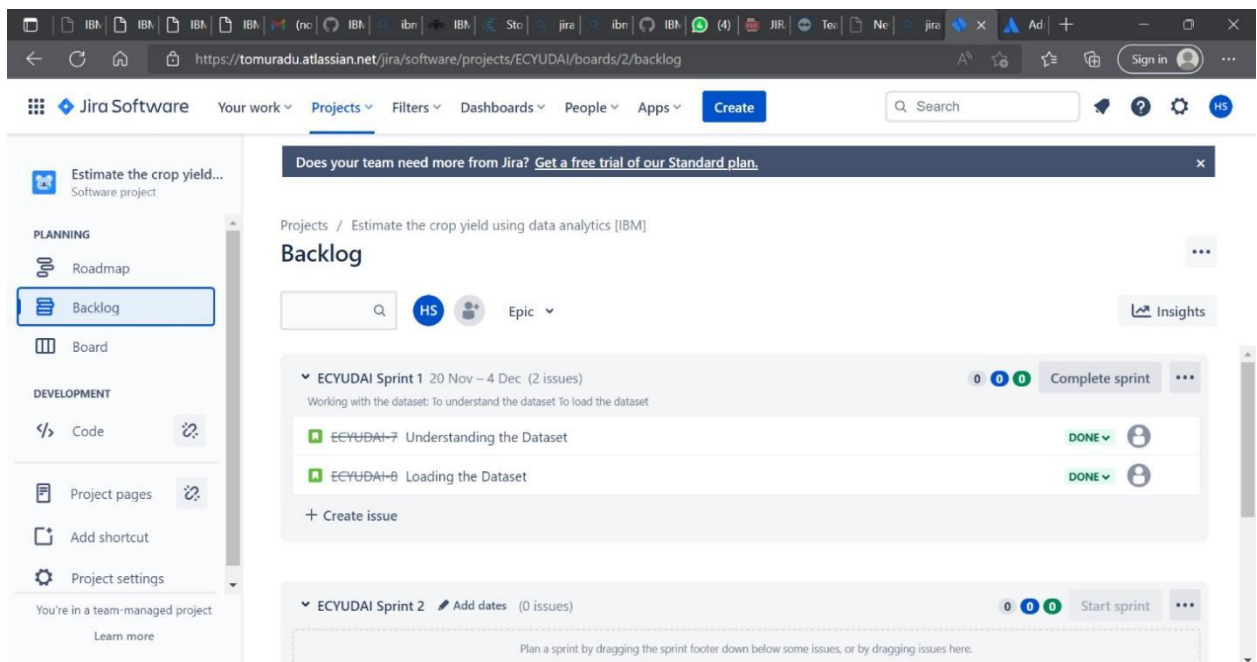
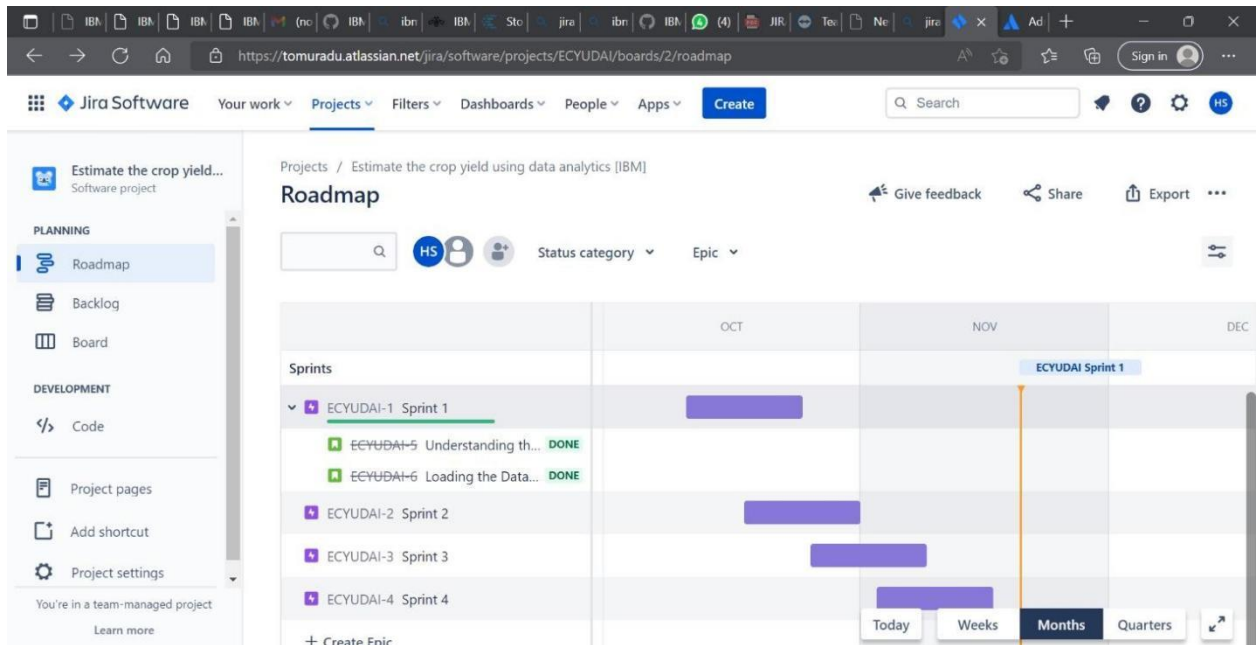
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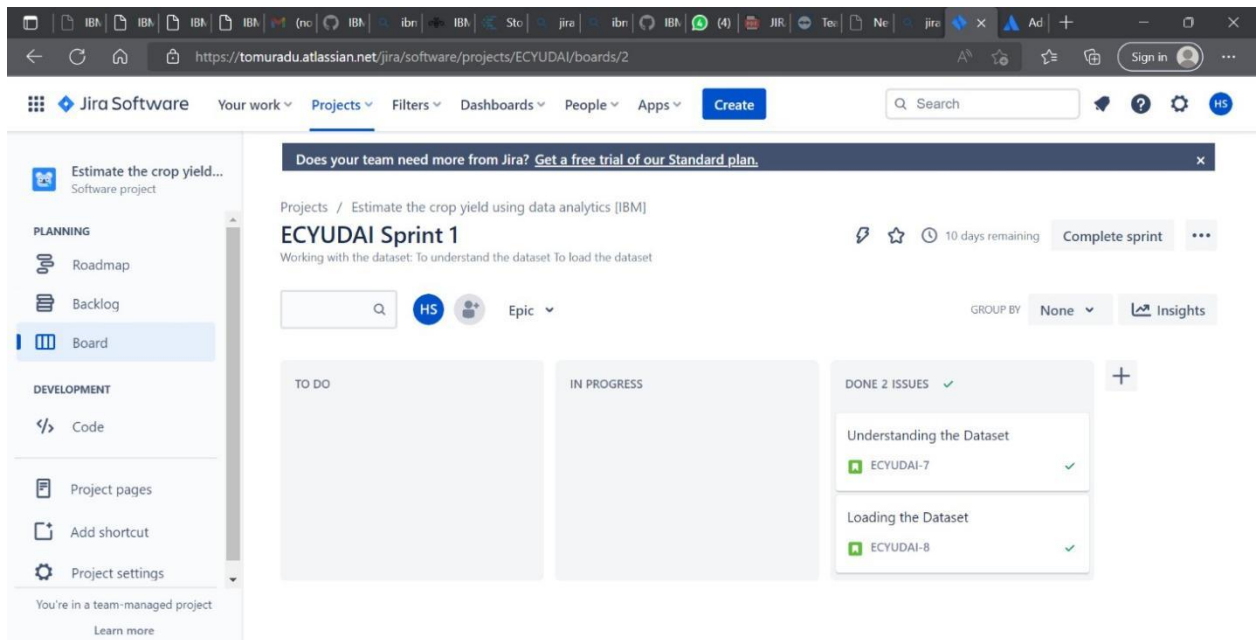
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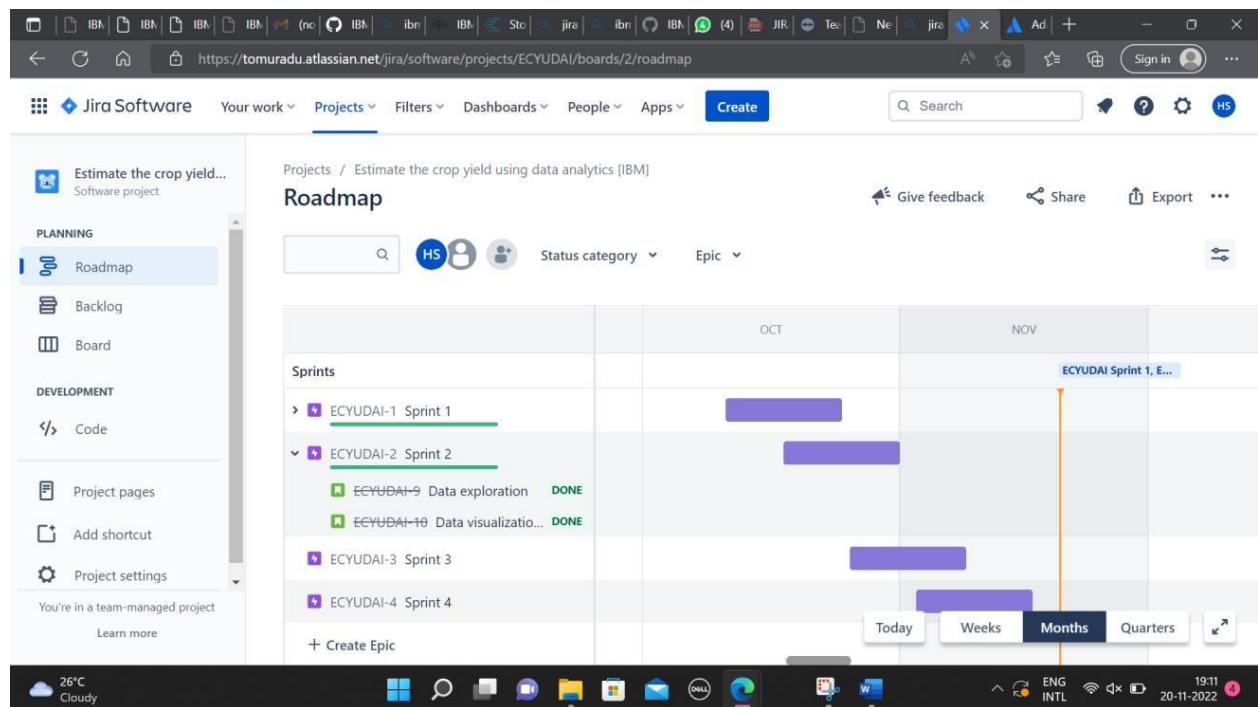
6.3 REPORTS FROM JIRA:

JIRA SOFTWARE UPDATE -1





JIRA SOFTWARE UPDATE -2



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Estimate the crop yield...
Software project

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Explore the data To create Visualization charts

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- ECYUDAI-12 Data visualization charts DONE ✓

+ Create issue

▼ Backlog (0 issues) 0 0 0 Create sprint

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- ECYUDAI-11 ✓
- Data visualization charts ✓
- ECYUDAI-12 ✓

Windows taskbar: 19:15 20-11-2022

JIRA SOFTWARE UPDATE -3

The screenshot shows the Jira Roadmap view for the project "Estimate the crop yield using data analytics [IBM]". The left sidebar contains navigation options: PLANNING (Roadmap, Backlog, Board) and DEVELOPMENT (Code, Project pages, Add shortcut, Project settings). The main area displays a timeline from October to December. Sprints are listed as follows:

Sprint	Start Date	End Date	Status
ECYUDAI-1 Sprint 1	Oct 15	Oct 25	In Progress
ECYUDAI-2 Sprint 2	Oct 25	Nov 5	In Progress
ECYUDAI-3 Sprint 3	Nov 5	Nov 15	In Progress
ECYUDAI-4 Sprint 4	Nov 15	Nov 25	In Progress

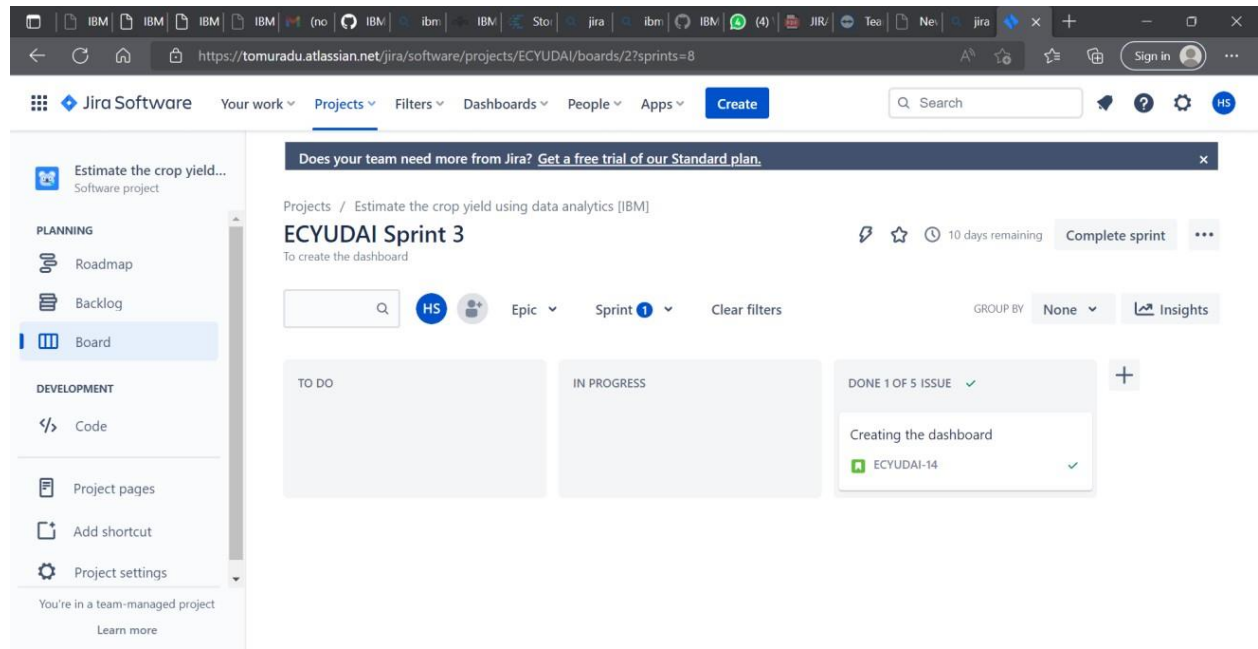
Below the sprints, there is a section for "ECYUDAI-13 Creating the Da..." with a status of "DONE". The bottom right corner shows navigation tabs: Today, Weeks, Months, and Quarters.

The screenshot shows the Jira Backlog view for the project "Estimate the crop yield using data analytics [IBM]". The left sidebar is the same as the Roadmap view. The main area displays a list of issues. A banner at the top asks: "Does your team need more from Jira? [Get a free trial of our Standard plan.](#)".

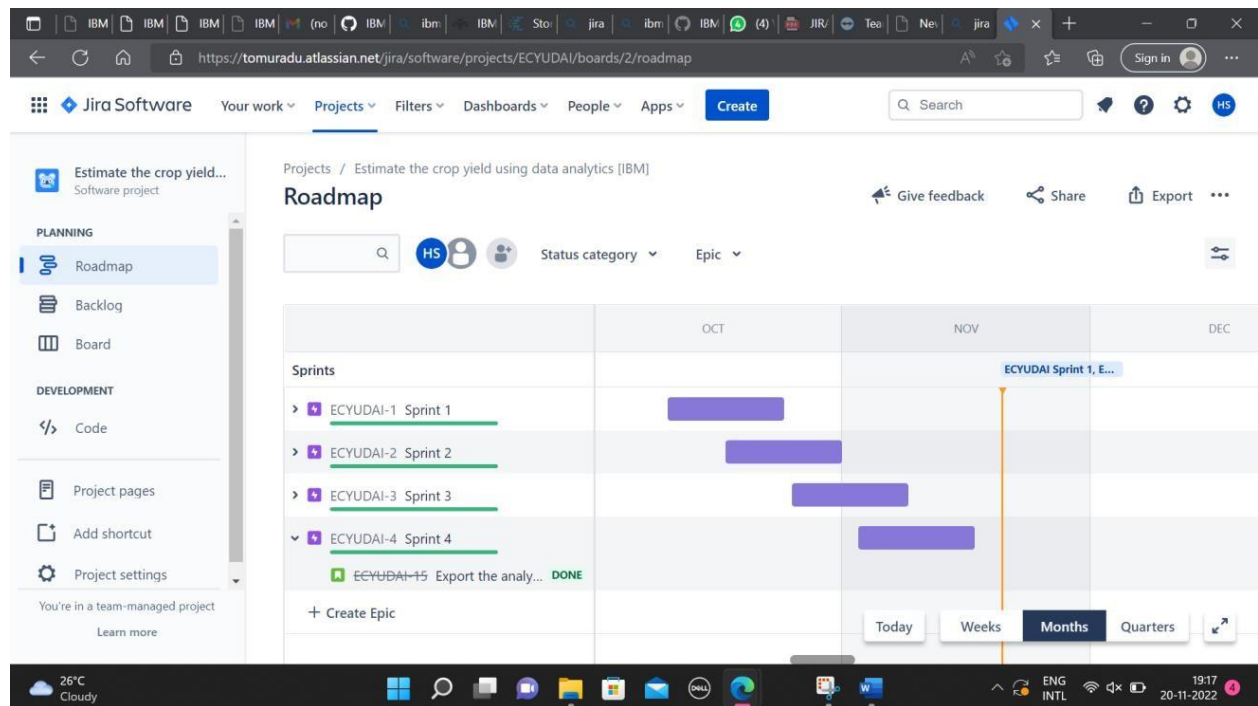
The backlog items are:

- ECYUDAI Sprint 3 20 Nov – 4 Dec (1 issue)
 - To create the dashboard
 - ECYUDAI-14 Creating the dashboard (Status: DONE)
 - + Create issue
- ECYUDAI Sprint 4 Add dates (0 issues)

The bottom right corner shows navigation tabs: Today, Weeks, Months, and Quarters.



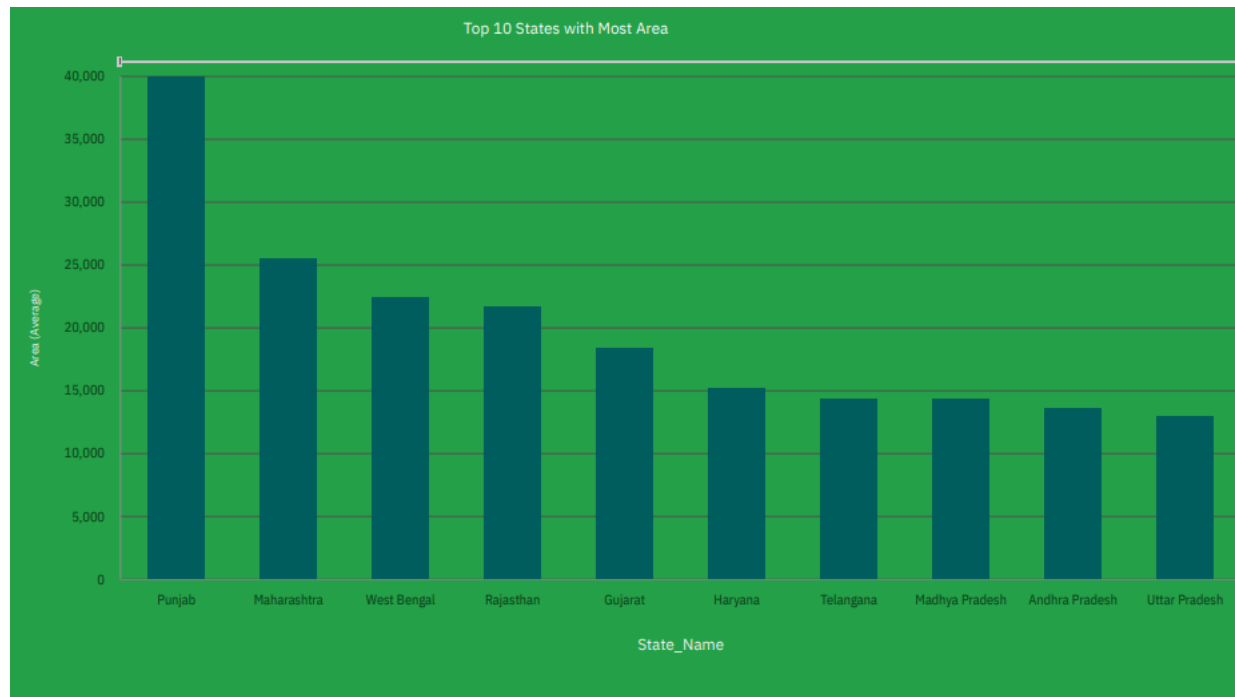
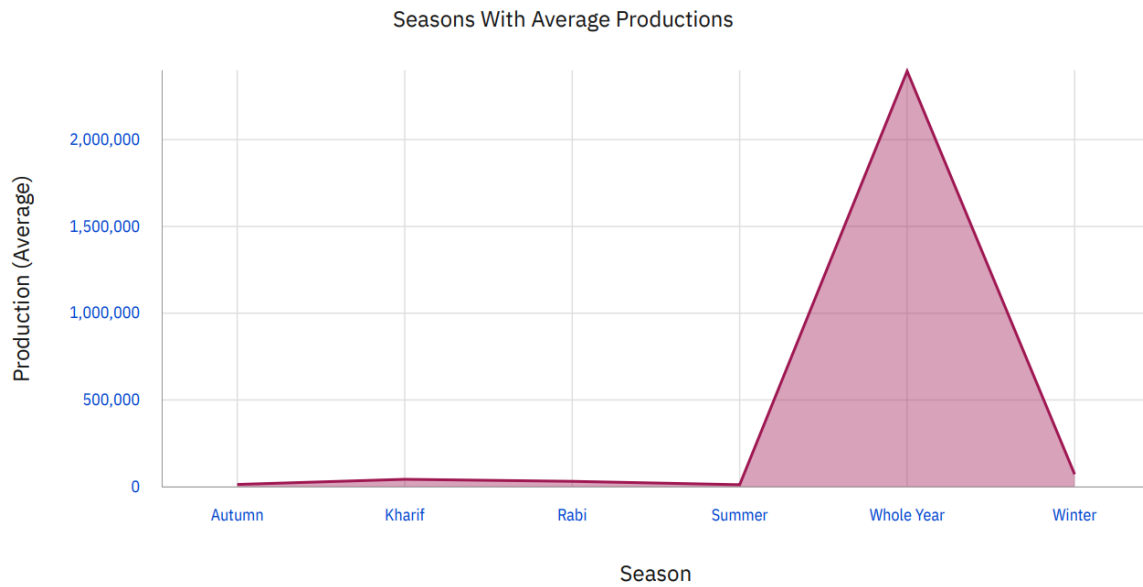
JIRA SOFTWARE UPDATE -4

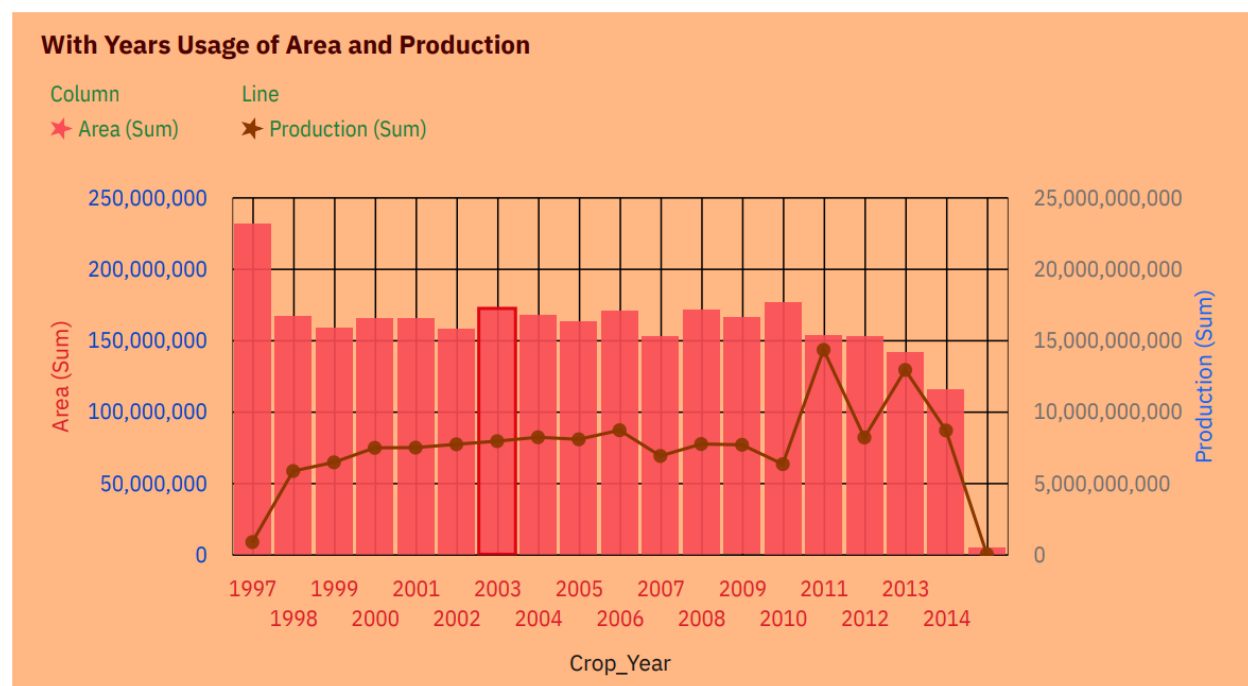
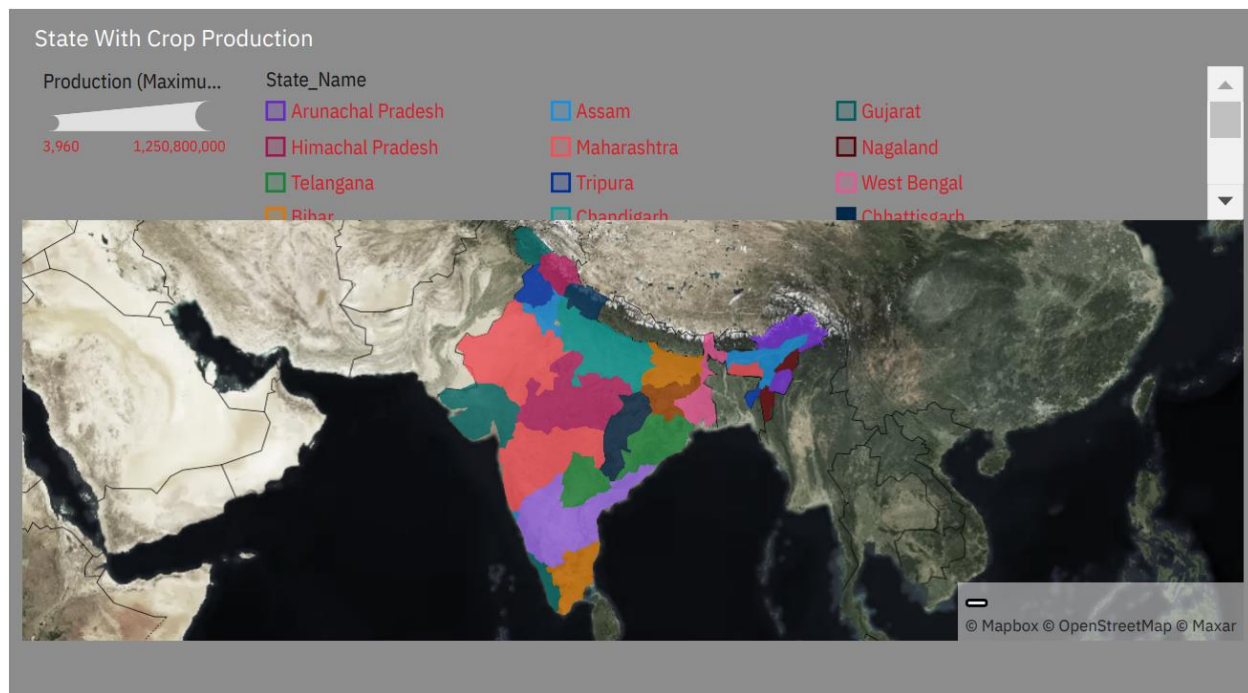


7.CODING & SOLUTIONING:

7.1 FEATURE 1:

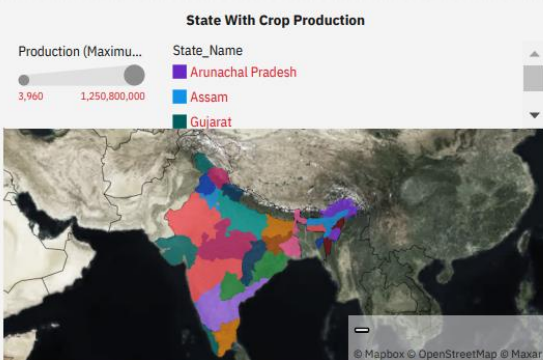
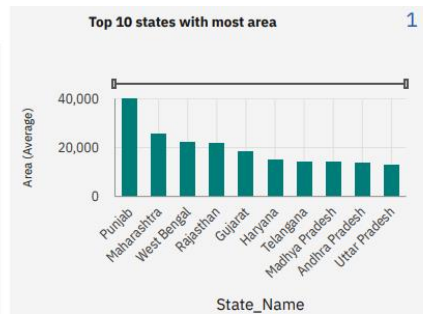
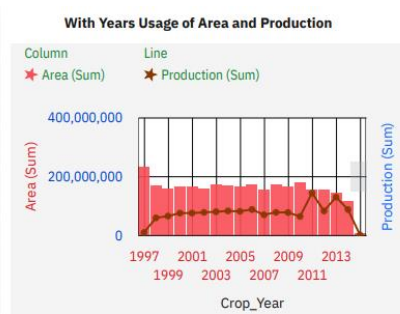
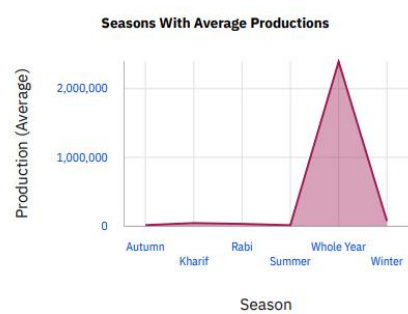
First developing the dashboard for the various data.





Season, Production and State_Name

State_Name	Season	Production
Andaman and Nicobar Islands	Autumn	25,248.95
	Kharif	214,239.06
	Rabi	11,598.92
	Whole Year	717,972,153.06
Summary		718,223,239.99
Andhra Pradesh	Kharif	200,336,054
	Rabi	98,156,193
	Whole Year	17,026,098,049
Summary		17,324,590,296
	Kharif	4,141,028.6



Season, Production and State_Name

State_Name	Season	Production
Andaman and Nicobar Islands	Autumn	25,248.95
	Kharif	214,239.06
	Rabi	11,598.92
	Whole Year	717,972,153.06
Summary		718,223,239.99
Andhra Pradesh	Kharif	200,336,054
	Rabi	98,156,193
	Whole Year	17,026,098,049
Summary		17,324,590,296

FEATURE 2:

HOME PAGE:

```
<!DOCTYPE html>

<html lang="en">

    <linkrel="stylesheet"href="https://maxcdn.bootstrapcdn.com/bootstrap/4.3.1/cs
s/bo          tstrap.min.css<script
src="https://ajax.googleapis.com/ajax/libs/jquery/3.4.0/jquery.min.js"></script>

    <script
src="https://cdnjs.cloudflare.com/ajax/libs/popper.js/1.14.7/umd/popper.min.js"></script>

    <link rel="stylesheet"

href="https://cdnjs.cloudflare.com/ajax/libs/font-awesome/4.7.0/css/font-
awesome.min.css">

    <script
src="https://maxcdn.bootstrapcdn.com/bootstrap/4.3.1/js/bootstrap.min.js"></script>

    <link rel="stylesheet" href="main.css">

    <title>IBM</title>

    <style>

*{

    padding:0px;

    margin:0px;

}

nav{

    background-color: black;

    height:50px;

    position: relative;}
```

```
ul{  
  
    position: sticky;  
  
    text-align: center;  
  
    font-family:Arial, Helvetica, sans-serif;  
  
}
```

```
li {  
  
    font-weight: bolder;  
  
    display: inline-block;  
  
    cursor: pointer;  
  
    padding:20px;  
  
    color:#fffaf0;  
  
    font-weight: bolder;  
  
    font-size:20px;  
  
    padding-top: 10px;  
  
}
```

```
li:hover{  
  
    background-color: #628b3c;  
  
}
```

```
</style>
```

```
</head>
```

```
<body><div>
```

```
<nav>
```

```
<ul>
```



```

<li><a href="index.html" style="text-decoration: none;color: inherit;">HOME</a></li>

<li><a href="userlogin1.html" style="text-decoration: none;color:
inherit;">LOGIN</li><li><a href="dashboard.html" style="text-decoration: none;color:
inherit;">DASHBOARD</a></li> </nav>

<h3 style="position: absolute;color:#fffaf0;top:300px;left:350px"><b>Estimate the crop
yield using Data Analytics</b></h3></div>

</body>

</html>

```

USERLOGIN:

```

<html>

<head>

<link rel="stylesheet"
href="https://maxcdn.bootstrapcdn.com/bootstrap/4.3.1/css/bootstrap.min.css">

<script src="https://ajax.googleapis.com/ajax/libs/jquery/3.4.0/jquery.min.js"></script>

<script
src="https://cdnjs.cloudflare.com/ajax/libs/popper.js/1.14.7/umd/popper.min.js"></script>

<link rel="stylesheet" href="https://cdnjs.cloudflare.com/ajax/libs/font-
awesome/4.7.0/css/font-awesome.min.css">

<script src="https://maxcdn.bootstrapcdn.com/bootstrap/4.3.1/js/bootstrap.min.js"></script>

<link rel="stylesheet" href="main.css">

<title>IBM</title>

<style>

```

```
*{  
  
    padding:0px;  
  
    margin:0px;  
  
}  
  
nav{  
  
    background-color: black;  
  
    height:50px;  
  
    position: relative;  
  
}  
  
ul{  
  
    position: sticky;  
  
    text-align: center;  
  
    font-family:Arial, Helvetica, sans-serif;  
  
}  
  
li {  
  
    font-weight: bolder;  
  
    display: inline-block;  
  
    padding:20px;  
  
    color:#fffaf0;  
  
    font-weight: bolder;  
  
    font-size:20px;  
  
    padding-top: 10px;  
  
}
```

```

    li:hover{

        background-color: #628b3c;

    }

input[type=checkbox]

{

    /* Double-sized Checkboxes */

    -ms-transform: scale(1.3); /* IE */

    -moz-transform: scale(1.3); /* FF */

    -webkit-transform: scale(1.3); /* Safari and Chrome */

    -o-transform: scale(1.3); /* Opera */

    transform: scale(1.3);

    padding: 5px;

}

</style>

</head>

<body>

<nav>

<ul>

<li><a href="index.html" style="text-decoration: none;color: inherit;">HOME</a></li>

<li><a href="userlogin1.html" style="text-decoration: none;color:

inherit;">LOGIN</li><li><a href="dashboard.html" style="text-decoration: none;color:

inherit;">DASHBOARD</a></li> </ul> </nav>

<div id="pic" style="float:left;background-size:cover;position :absolute;opacity:0.7">



```

</div>

<div id="back" style="margin:0px;"></div>

<div class="container" style="width:70%;margin-left:15%; position:relative;
background:rgba(255, 255, 255, 0.671);margin-top:80px;padding:10px;border-
radius:10px;border:.5px solid black;box-shadow:1px 2px 3px 0px;">

<div class="heading" style="border-bottom:2px solid #0a0a0a; text-align:center;">

<h3>LOG INTO USER</h3>

</div>

<div class="log" >

<form class="container" action="userlogin2.php" method="POST" >

<input type="text" class="form-control" placeholder="Username" name="username">

<input type="password" class="form-control" placeholder="Password" name="pass">

<input type="checkbox" class="form-check-input" name="chk[]" style="margin-
left:5px;"><p style="margin-left:25px;">Remember me.</p>

<a href="dashboard1.html" type="submit" class="form-control btn btn-primary"
value="Login">Login
</button>

</form><form >

<a href="index.html" class="form-control btn btn-dark" style="width:auto;margin-top:
30px;"> Cancel

</form></div>

</div>

</body>

</html>

MAINDASHBOARD:

<!DOCTYPE html>

<html lang="en">

<head>

<link rel="stylesheet"

href="https://maxcdn.bootstrapcdn.com/bootstrap/4.3.1/css/bootstrap.min.css">

<script src="https://ajax.googleapis.com/ajax/libs/jquery/3.4.0/jquery.min.js"></script>

<script

src="https://cdnjs.cloudflare.com/ajax/libs/popper.js/1.14.7/umd/popper.min.js"></src>

<link rel="stylesheet" href="https://cdnjs.cloudflare.com/ajax/libs/font-

awesome/4.7.0/css/font-awesome.min.css"><script

src="https://maxcdn.bootstrapcdn.com/bootstrap/4.3.1/js/bootstrap.min.js"></script><link

rel="stylesheet" href="main.css">

<title>IBM</title>

<style>

*{

padding:0px;

margin:0px;

}

nav{

background-color: black;

height:50px;

position: relative;

}

ul{

```
    position: sticky;

    text-align: center;

    font-family: Arial, Helvetica, sans-serif;
}
```

```
li {

    font-weight: bolder;

    display: inline-block;

    padding: 20px;

    color: #fffa0;

    font-weight: bolder;

    font-size: 20px;

    padding-top: 10px;

}
```

```
li: hover{

    background-color: #628b3c;

}
```

```
.box{

    width: 400px;

    height: 50px;

    left: 430px;

    background-color: #4F7942;

    position: absolute;

    border-radius: 10px;
```

```

        box-shadow:5px 5px 5px rgb(168, 167, 167);

    }

</style>

</head>

<body><div><nav>

<ul>

<li><a href="index.html" style="text-decoration: none;color: inherit;">HOME</a></li>

<li><a href="userlogin1.html" style="text-decoration: none;color: inherit;">LOGIN</li>

<li><a href="dashboard.html" style="text-decoration: none;color:
inherit;">DASHBOARD</a></li>

</ul>

</nav>



<h3 style="position: absolute;color:#fffaf0;top:80px;left:430px;text-align:
center;"><b>DATA VISUALIZATION CHARTS</b></h3>

<div class="box" style="top:180px"><a href="1.html" style="text-
decoration:none;color:#fffaf0;margin-left: 45px;top:20px;"><b>SEASONS WITH
AVERAGE PRODUCTIONS</b></a></div>

<div class="box" style="top:240px"><a href="2.html" style="text-
decoration:none;color:#fffaf0;margin-left: 15px;top:20px"><b>WITH YEARS USAGE OF
AREA AND PRODUCTION</b></a></div>

<div class="box" style="top:300px"><a href="3.html" style="text-
decoration:none;color:#fffaf0;margin-left: 65px;top:20px"><b>TOP 10 STATES WITH
MOST AREA</b></a></div>

```

```
<div class="box" style="top:360px"><a href="4.html" style="text-
decoration:none;color:#fffaf0;margin-left: 68px;top:20px"><b>STATE WITH CROP
PRODUCTION</b></a></div>
```

```
<div class="box" style="top:420px"><a href="5.html" style="text-
decoration:none;color:#fffaf0;margin-left: 30px;top:20px"><b>STATE WITH THE CROP
PRODUCTION ALONG<br><a style="margin-left: 90px;color:#fffaf0">WITH SEASON
[TEXT TABLE]</a></b></a></div>
```

```
<div class="box" style="top:480px"><a href="6.html" style="text-
decoration:none;color:#fffaf0;margin-left:
150px;top:20px"><b>DASHBOARD</b></a></div>
```

```
</div>
```

```
</body>
```

```
</html>
```


8.TESTING

8.1. TESTCASE:

USER ACCEPTANCE TESTING:

User acceptance Testing: UAT is a type of testing performed by the end user or the client to verify/accept the software system before moving the software application to the production environment. UAT is done in the final phase of testing after functional, integration and system testing is done.

1. Purpose of Document

The purpose of this document is to briefly explain the test coverage and open issues of the [ProductName] project at the time of the release to User Acceptance Testing (UAT).

2. Defect Analysis

This report shows the number of resolved or closed bugs at each severity level, and how they were resolved.

Resolution	Severity 1	Severity 2	Severity 3	Severity 4	Subtotal
By Design	8	4	2	2	16
Duplicate	4	2	3	0	9
External	2	3	0	1	6
Fixed	22	7	4	18	51
Not Reproduced	0	0	1	0	1
Skipped	1	1	0	0	2
Won't Fix	2	0	1	0	3
Totals	41	17	12	22	92

3. Test Case Analysis

This report shows the number of test cases that have passed, failed, and untested.

Section	Total Cases	Not Tested	Fail	Pass
Print Engine	4	0	0	4
Client Application	45	0	1	46
Security	2	0	0	2
Outsource Shipping	3	0	0	3
Exception Reporting	9	0	0	9
Final Report Output	4	0	0	4
Version Control	2	0	0	2

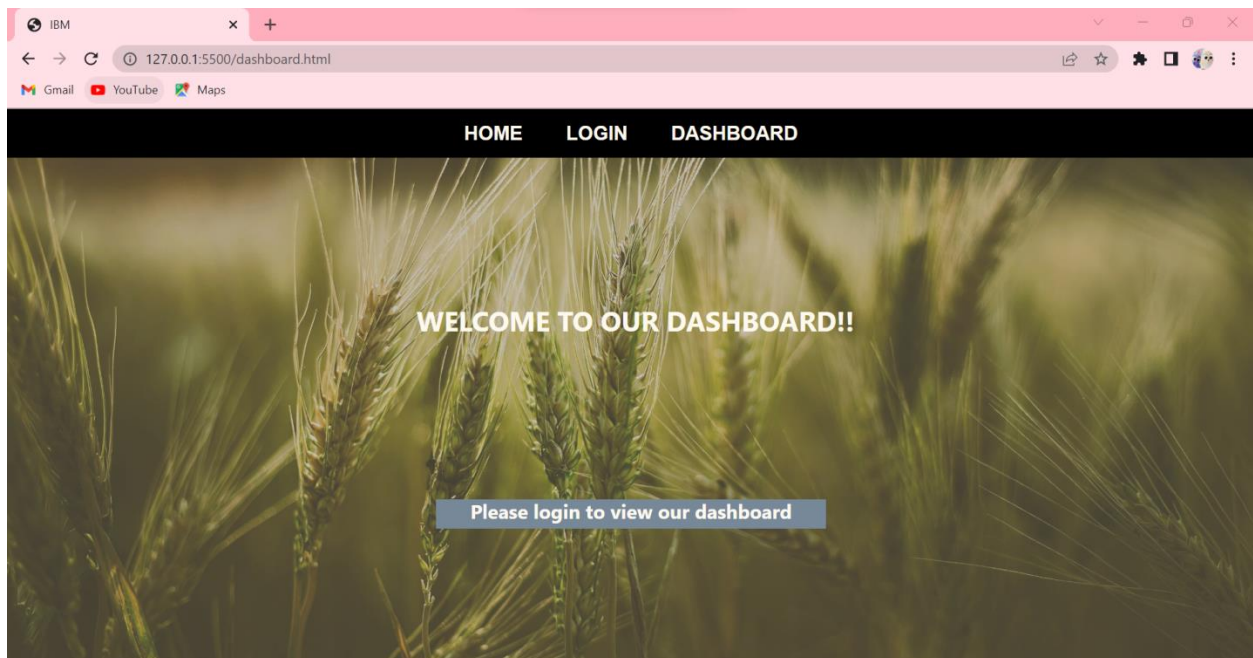
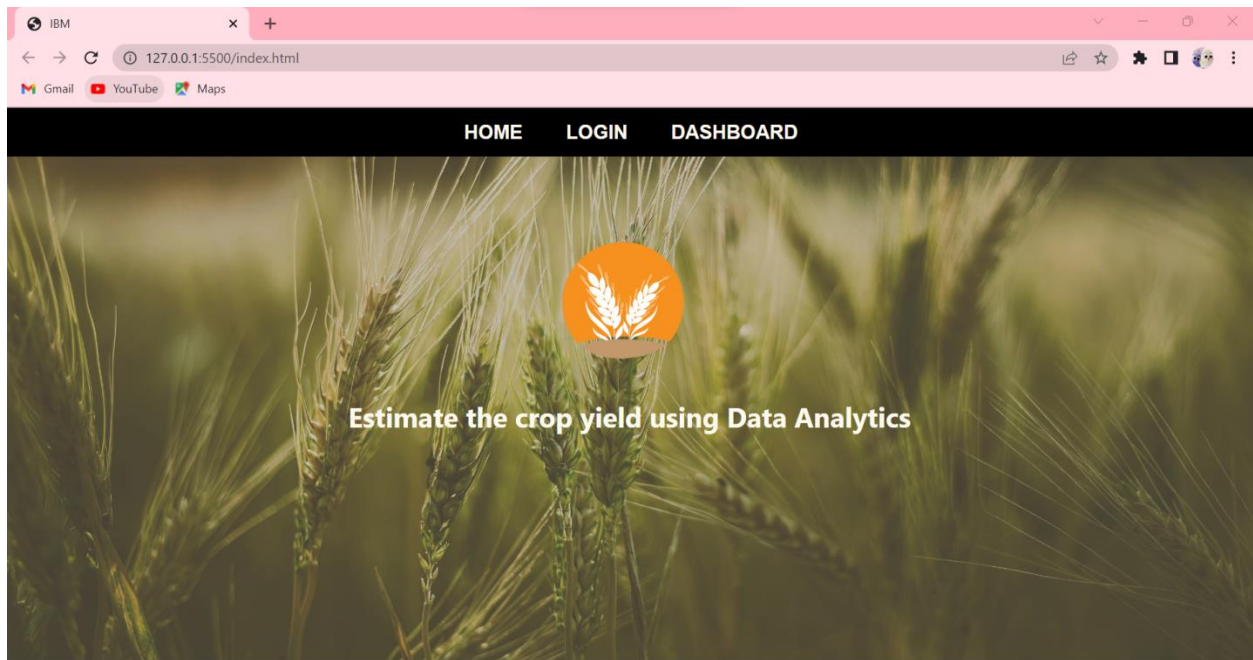
PERFORMANCE TESTING:

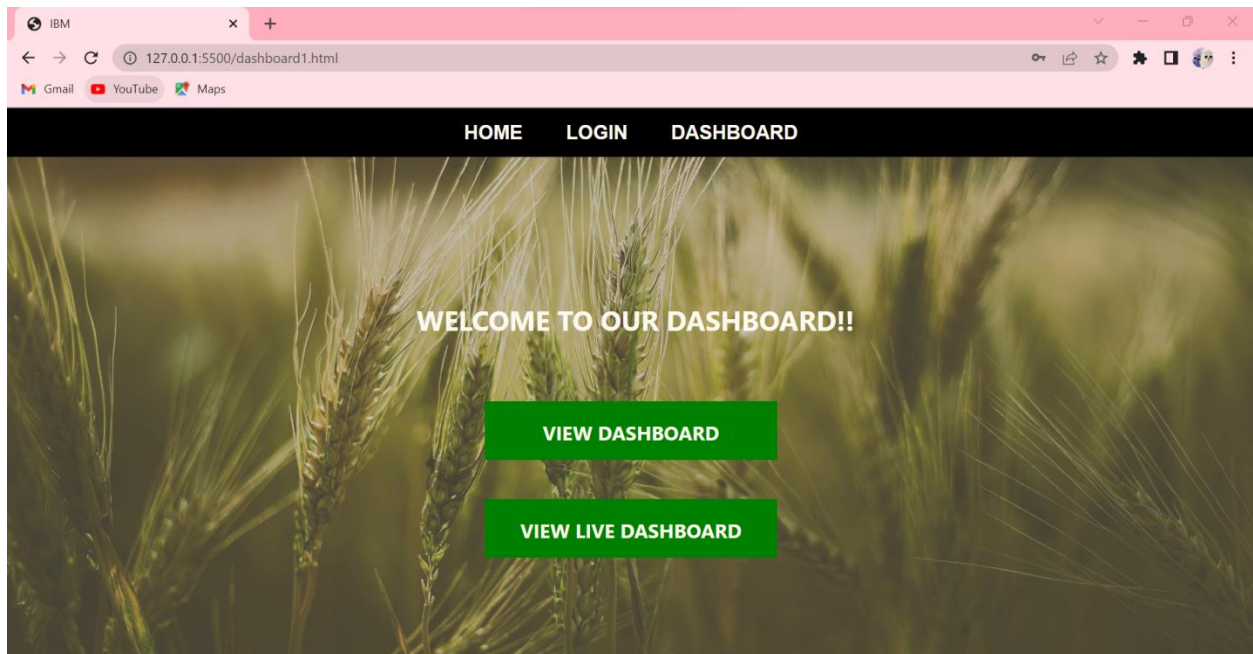
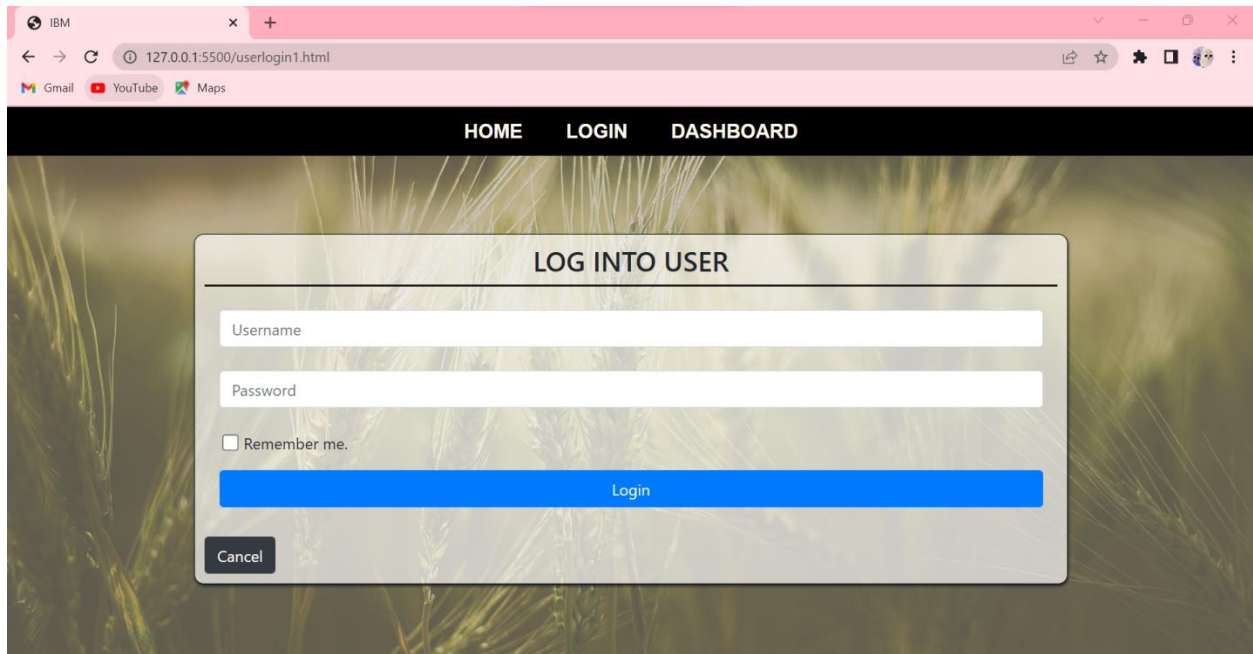
Performance Testing is the practice of evaluating how a system performs in terms of responsiveness and stability under a particular workload. Performance Tests are typically executed to examine speed, robustness, reliability and application size.

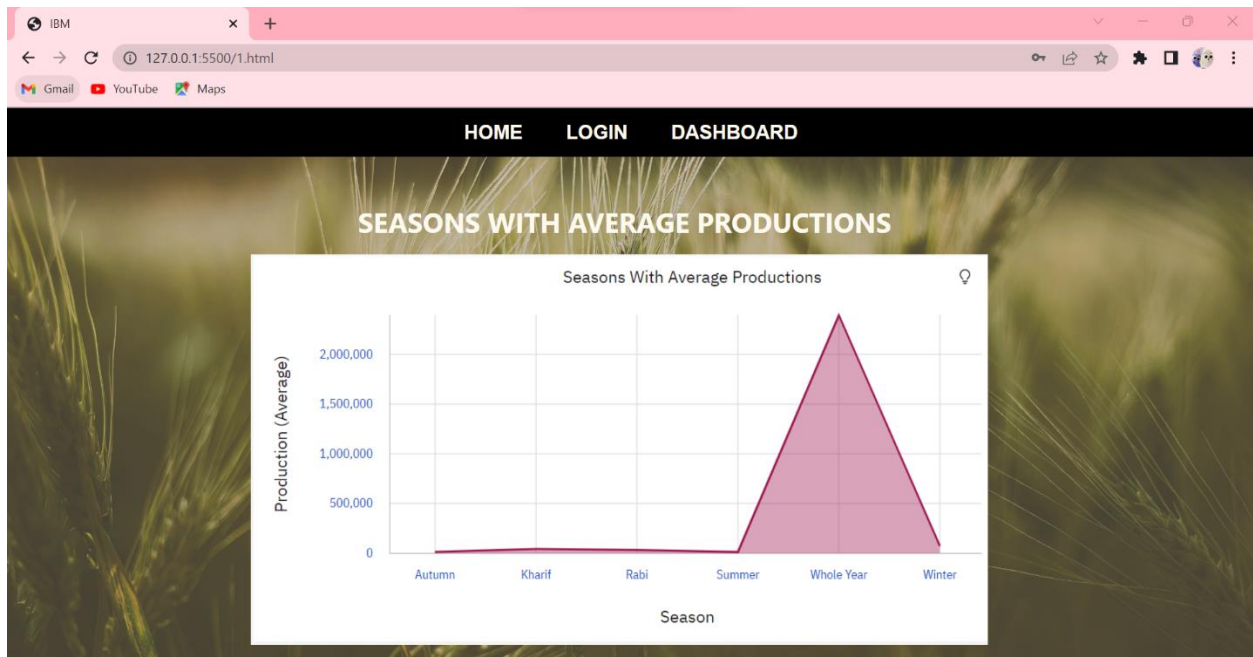
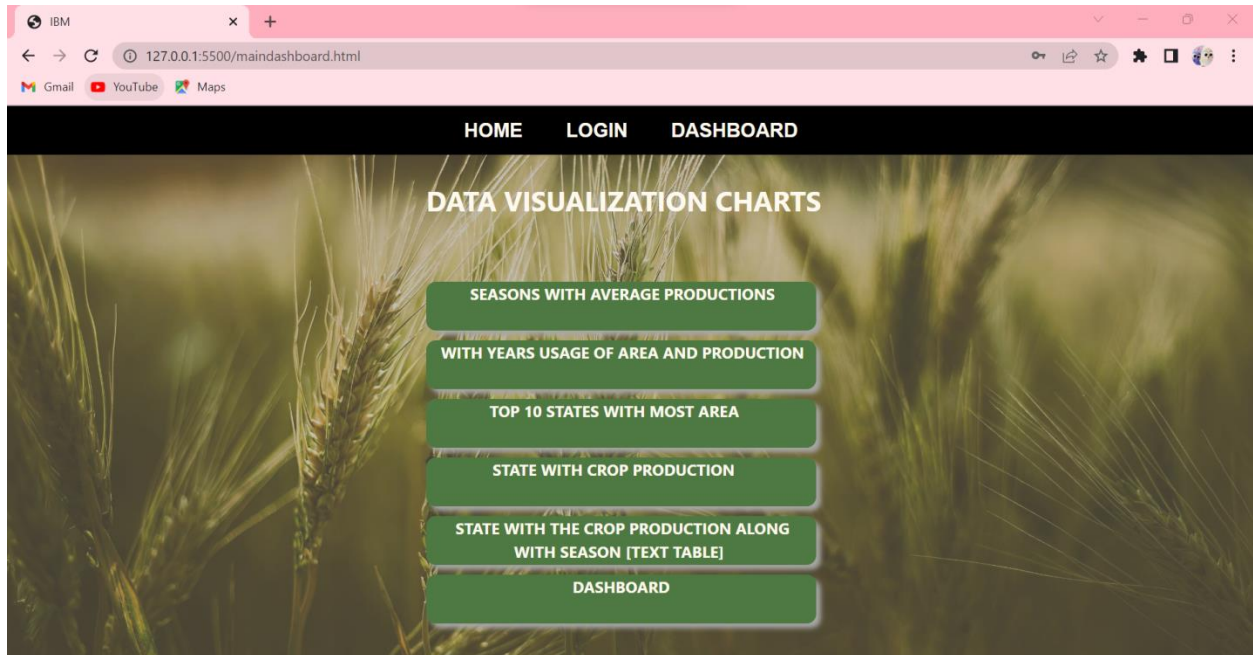
S. No	Parameter	Screenshot / Values
1.	Dashboard design	No of Visualizations / Graphs – 5
2.	Data Responsiveness	Yes, the website is responsive completely
3.	Amount Data to Rendered (DB2 Metrics)	Totally there are 246092 records in the dataset.
4.	Utilization of Data Filters	Data Filter used in Estimate The Crop Yield is the Crop attribute.

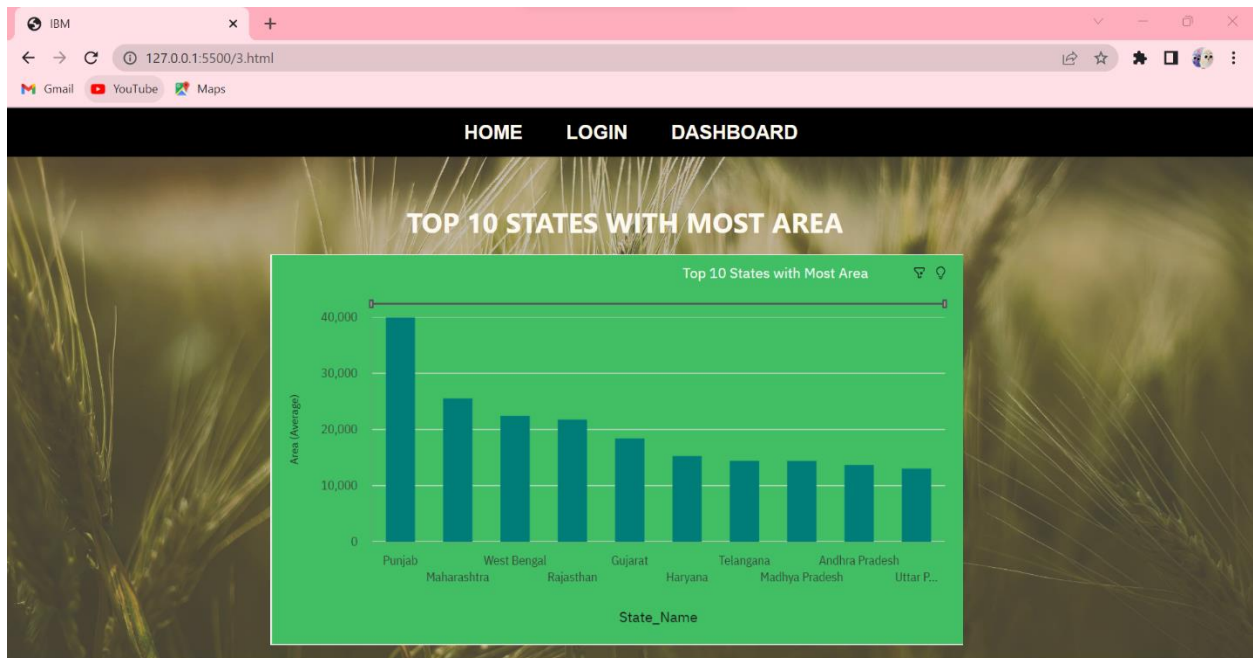
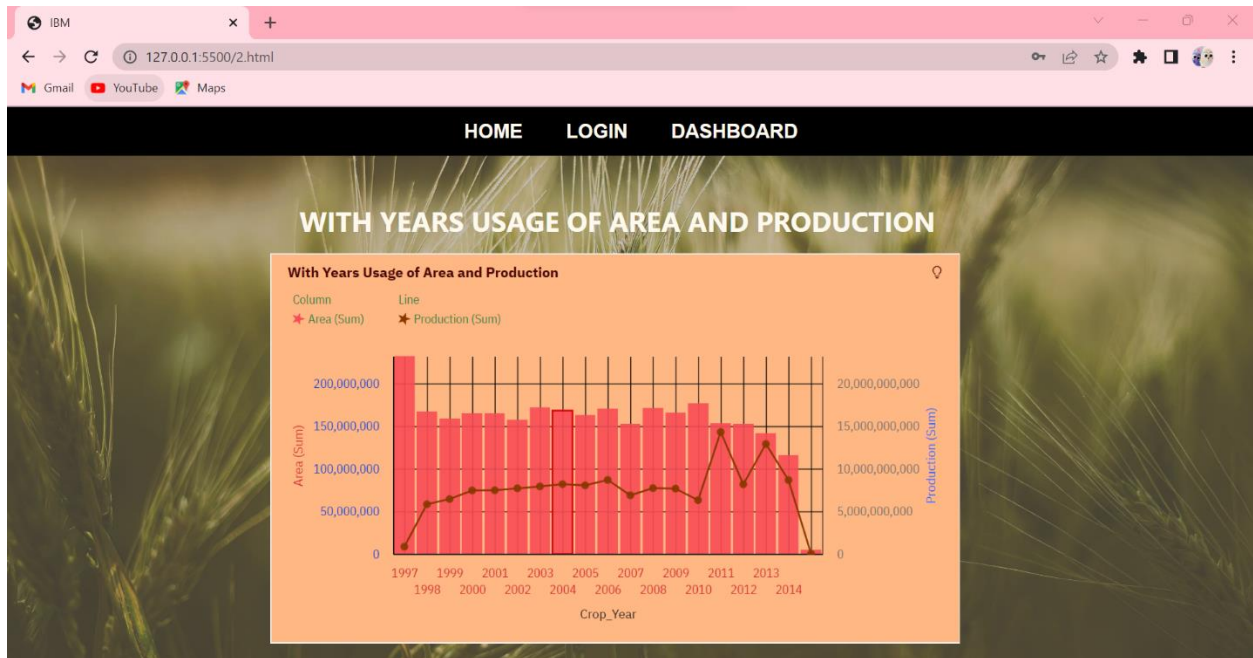
5.	Effective User Story	<p>No of Scene Added – 12</p> <ul style="list-style-type: none"> • To create the Home page of the Website • To create the Log in page of the Website • To create the Dashboard page of the Website • To work on the given dataset ,Understand the Dataset • Load the dataset in IBM Cognos then build the required Visualizations • Using the Crop production in Indian dataset, create various visualization graphs and charts to highlight the insights and visualizations. • Build a Visualizations to showcase Average Crop Production by Seasons • Showcase the Yearly usage of Area in Crop Production • To showcase the Top 10 states with most area • To showcase the states with crop production • To showcase the states with crop production along with seasons • To view the dashboard
6.	Descriptive Reports	<p>No of Visualizations / Graphs – 5</p> <ul style="list-style-type: none"> • Visualization1 - Average Crop Production by Seasons • Visualization2 - Yearly usage of area in crop production • Visualization3 - Top 10 States in Crop Yield Production by Area • Visualization 4 - Crop Production by State • Visualization5 - Represent the States with Seasonal Crop Production using a Text representation

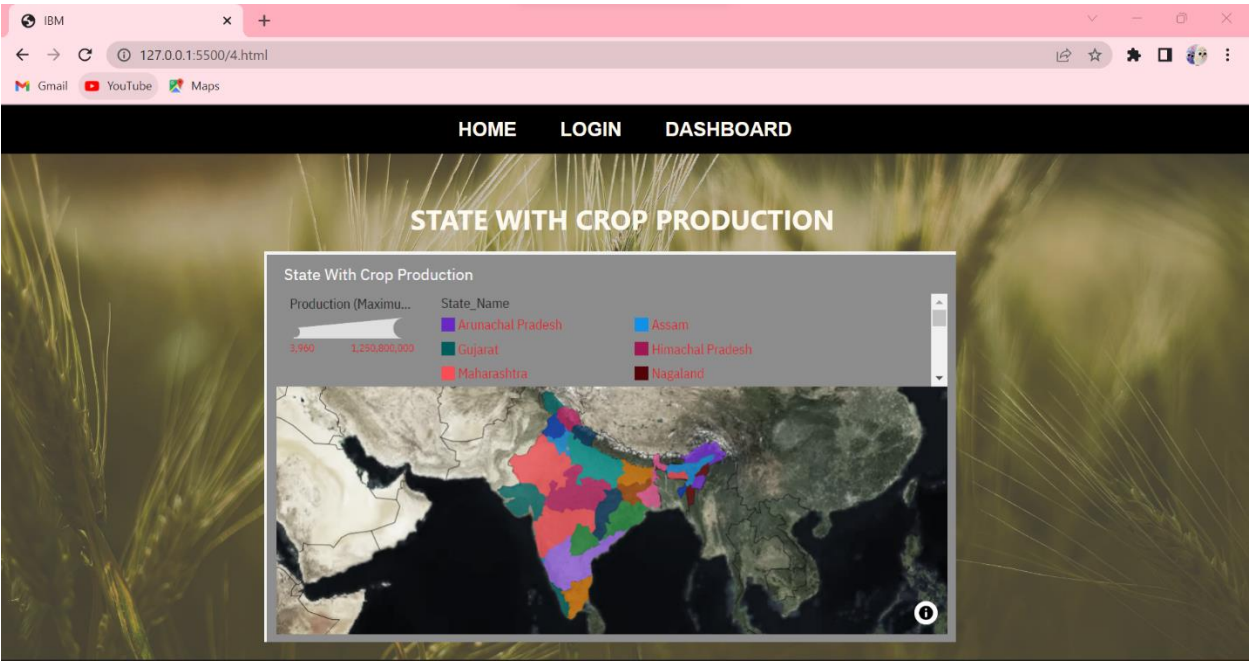
9.RESULTS:











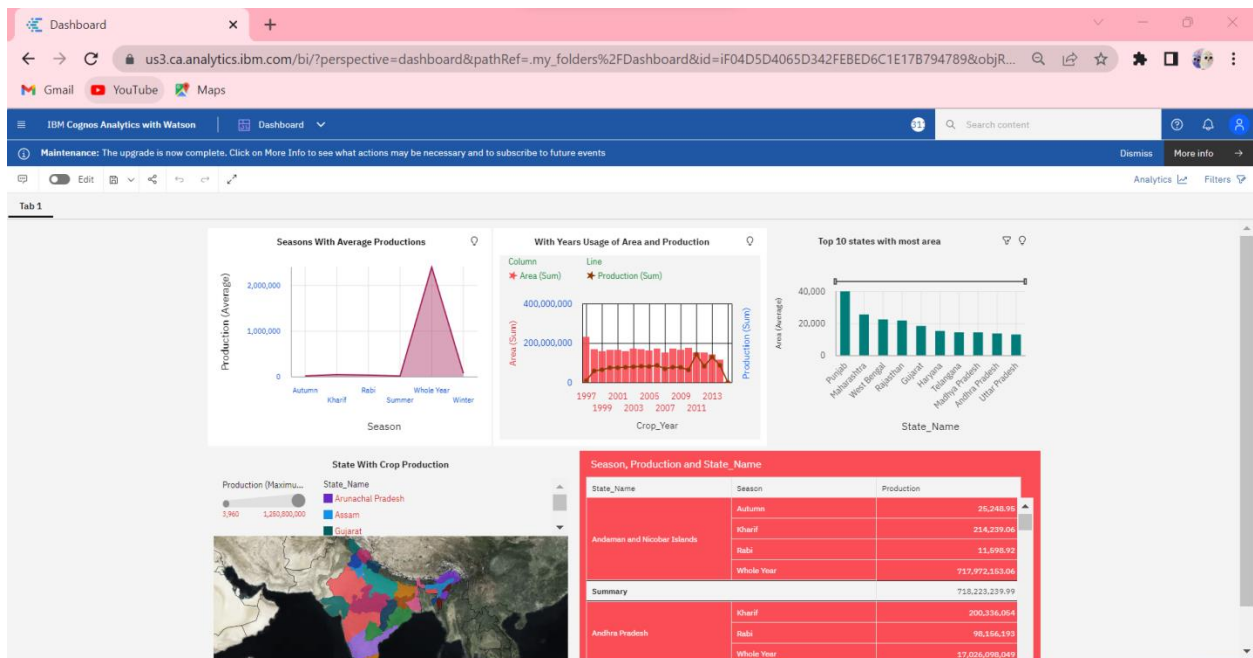
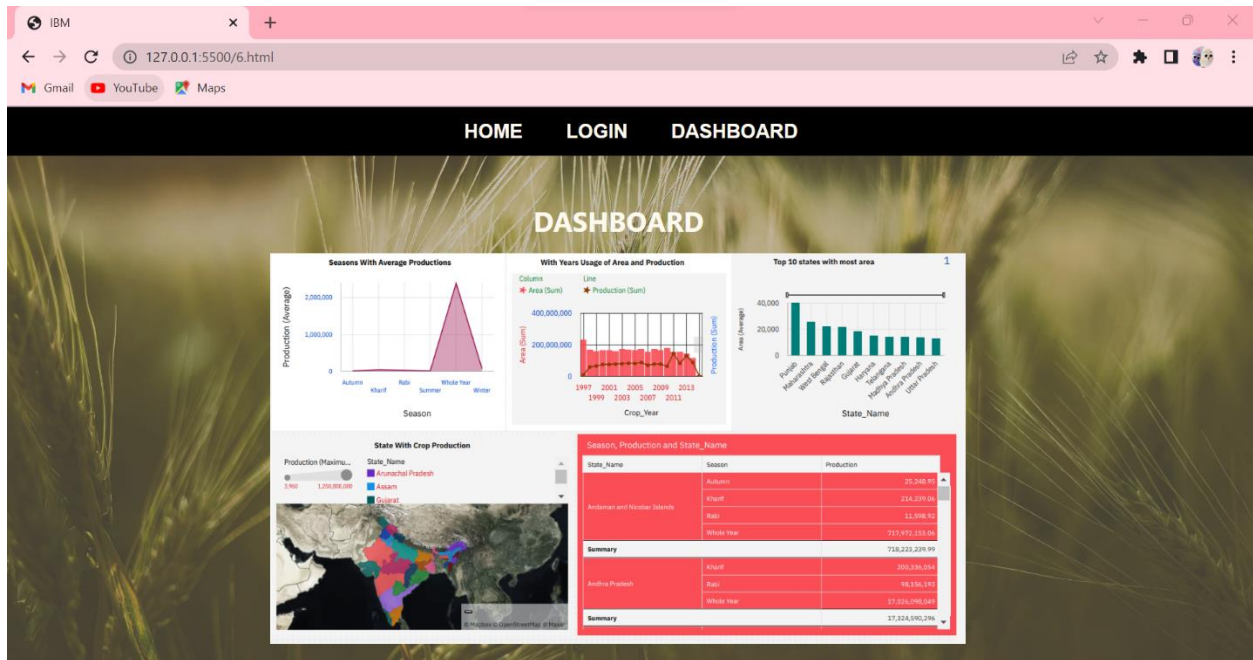
IBM 127.0.0.1:5500/5.html

HOME LOGIN DASHBOARD

STATE WITH THE CROP PRODUCTION ALONG WITH SEASON[TEXT TABLE]

Season, Production and State_Name

State_Name	Season	Production
Andaman and Nicobar Islands	Autumn	25,248.95
	Kharif	214,239.06
	Rabi	11,598.92
	Whole Year	717,972,153.06
Summary		718,223,239.99
Andhra Pradesh	Kharif	200,336,054
	Rabi	98,156,193
	Whole Year	17,026,098,049
Summary		17,324,590,296
	Kharif	4,141,028.6



10.ADVANTAGES AND DISADVANTAGES:

- **ADVANTAGES:**

- One can easily analyse and understand trends in cropping pattern, seasonal behaviour of land in various areas with the created dashboard.
- Increase the yield from existing farmlands.
- Big data provides farmers granular data on rainfall patterns, water cycles, fertilizer requirements, and more. This enables them to make smart decisions, such as what crops to plant for better profitability and when to harvest.

- **DISADVANTAGES:**

- Computational complexity.
- Not all factors influencing the crop yield are being considered for the analysis as we have only taken visible factors into account for the analysis.

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 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 . The analysis has been done using machine learning framework WEKA. In the work carried out in , various algorithms applied in the 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 with a case study of Netherlands.

12. FUTURE SCOPE

This project describes crop yield prediction ability of the algorithm. In future we can determine the efficient algorithm based on their accuracy metrics that will helps to choose an efficient algorithm for crop yield prediction. Our research suggests that farmers' decisions about the production of non-rice crops on different plots and the use of resources other than land, such as labour and outside inputs, continue to influence their decisions regarding the production of rice. Rice production may continue to be atomistic, with many farmers producing tiny amounts of rice rather than a small number of farmers producing big amounts.

13.APPENDIX

SOURCE CODE

[https://drive.google.com/drive/folders/1fok9rsoHlcoo0fpH9g9beguf5nGw_XwM?
usp=share_link](https://drive.google.com/drive/folders/1fok9rsoHlcoo0fpH9g9beguf5nGw_XwM?usp=share_link)

GITHUB LINK

<https://github.com/IBM-EPBL/IBM-Project-41112-1660639531.git>

PROJECT DEMO LINK

[https://drive.google.com/drive/folders/1A8CqYSgnPM6pgf46DcVAGGq4asBb_
Brd?usp=sharing](https://drive.google.com/drive/folders/1A8CqYSgnPM6pgf46DcVAGGq4asBb_Brd?usp=sharing)