Analysing Agriculture in INDIA and making strageic decisons based on it according to population

Website Link:

https://whiteknightjr.github.io/IBM_HACK_CHALLENGE_2023/

Demo video:

https://drive.google.com/drive/folders/1ezI4hq6SqPD8u1n5uMWrV4Q4i5QnDtBy?usp=sharing

IBM HACK CHALLENGE 2023

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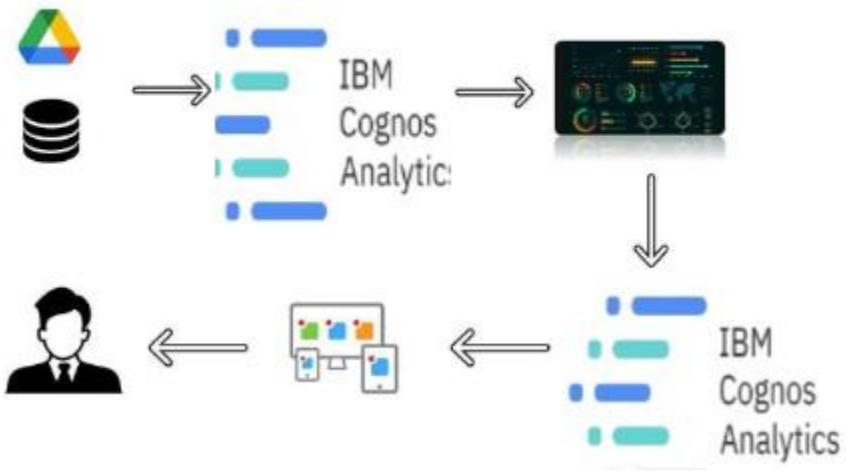
Analysing Agriculture in INDIA and making strageic decisons based on it according to population

This analysis focuses on the agricultural sector in India and proposes strategic decision-making based on population trends. By examining the agricultural landscape, including crop production, farming techniques, and infrastructure, we aim to understand the challenges and opportunities associated with meeting the needs of India's growing population. By leveraging population data and demographic patterns, we can develop strategic plans that address food security, optimize resource allocation, and promote sustainable agricultural practices. Through a comprehensive understanding of the agricultural sector and population dynamics, our goal is to enhance productivity, ensure food sufficiency, and foster long-term growth for India's agricultural industry.

Technical Architecture:



Project Flow
To accomplish this, we have to complete all the activities listed below,

Define Problem / Problem Understanding

- Specify the business problem
- Business requirements
- Literature Survey
- Social or Business Impact.

Data Collection & Extraction from Database

- Collect the dataset,
- Connect IBM DB2 with IBM cognos

Data Preparation

- Prepare the Data for Visualization

Data Visualizations

- No of Unique Visualizations

Dashboard

- Responsive and Design of Dashboard

Report

- Creating a report

Performance Testing

- Amount of Data Rendered to DB ‘
- Utilization of Data Filters
- No of Calculation Fields
- No of Visualizations/ Graphs

Web Integration

- Dashboard and Story embed with UI With Flask

Project Demonstration & Documentation

- Record explanation Video for project end to end solution
- Project Documentation-Step by step project development procedure

The Business Problem

The business problem involves conducting a comprehensive analysis of the agricultural sector in India and formulating strategic decisions based on population dynamics. Agriculture plays a pivotal role in India's economy, employing a significant portion of the population and contributing to the country's GDP. However,

the sector faces numerous challenges including fluctuating crop yields, changing climate patterns, and varying demand patterns due to the country's vast and diverse population.

Business Requirements

The business requirements for this project would likely include

Data collection:

The first requirement is to collect data from Kaggle that is relevant to the Company name, Job Title, Salary, Salaries reported, Location, Employment Status, Job roles, and rating

Data cleaning and preparation:

The collected data must be cleaned and processed to ensure it is suitable for analysis. This may involve removing irrelevant information, correcting inconsistencies and missing values, and transforming the data into a format that is compatible with the analysis tools.

Data analysis:

The data must be analyzed to uncover meaningful insights. This could involve using techniques such as descriptive statistics, regression analysis and data visualization to gain a deeper understanding of the data.

Report creation:

The insights and findings from the data analysis must be presented in a comprehensive report that includes visualizations and data tables. The report must be well organized and easy to understand, with clear and concise explanations of the results.

Literature Survey

This comprehensive literature survey delves into the complex interplay between agricultural practices, demographic trends, and strategic decision-making in India. The agricultural sector in India faces multifaceted challenges stemming from population growth, shifting consumption patterns, and the imperative to ensure food security while maintaining environmental sustainability. Through an exploration of various research articles and studies, this literature review sheds light on the critical areas of concern and potential solutions.

Social Or Business Impact

Social Impact: In essence, the social impact of analyzing agriculture in India and making strategic decisions based on population dynamics extends far beyond the agricultural sector. It touches upon fundamental aspects of human life, including food security, health, livelihoods, and environmental sustainability. By recognizing the intricate interplay between agriculture and society, India can shape a more resilient, inclusive, and prosperous future for all its citizens.

Business Model/Impact: The business impact of aligning agricultural practices with population dynamics extends beyond traditional farming sectors. It influences supply chains, technology adoption, brand

reputation, and policy advocacy. By embracing data-driven insights and responsive strategies, businesses can capitalize on emerging opportunities, enhance their competitiveness, and contribute to the economic growth of India while addressing the evolving needs of its population.

Data Collection & Extraction From Database

Data collection is the process of gathering and measuring information on variables of interest in an established, systematic fashion that enables one to answer stated research questions, test hypotheses, evaluate outcomes, and generate insights from the data.

Collect The Dataset

Activity 1: Understand the data

Check out the below link to understand the dataset in detail:
https://www.kaggle.com/datasets/sanamps/crop-production-in-india

Activity 2: Connect IBM Cognos with the dataset

Data Preparation

Data preparation for IBM Cognos involves the process of organizing, cleaning, and transforming raw data into a format that can be effectively visualized and analyzed within IBM Cognos. This includes tasks such as data cleaning, data integration, data formatting, and data aggregation. The goal is to ensure that the data is accurate, consistent, and structured in a way that enables meaningful insights and visualizations in IBM Cognos.

Prepare The Data For Visualization

Preparing the data for visualization involves cleaning the data to remove irrelevant or missing data, transforming the data into a format that can be easily visualized, exploring the data to identify patterns and trends, filtering the data to focus on specific subsets of data, preparing the data for visualization software, and ensuring the data is accurate and complete. This process helps to make the data easily understandable and ready for creating visualizations to gain insights into the performance and efficiency.

Data Visualization

Data visualization is the process of creating graphical representations of data in order to help people understand and explore the information. The goal of data visualization is to make complex datasets more accessible, intuitive, and easier to interpret. By using visual elements such as charts, graphs, and maps, data visualizations can help people quickly identify patterns, trends, and outliers in the data.

No Of Unique Visualizations (Filters Applied)

The number of unique visualizations that can be created with a given dataset. Some common types of visualizations that can be used to analyze the data include bar charts, line charts, heat maps, scatter plots, pie charts, maps, etc. These visualizations can be used to compare performance, track changes over time, show distribution, and show relationships between variables.

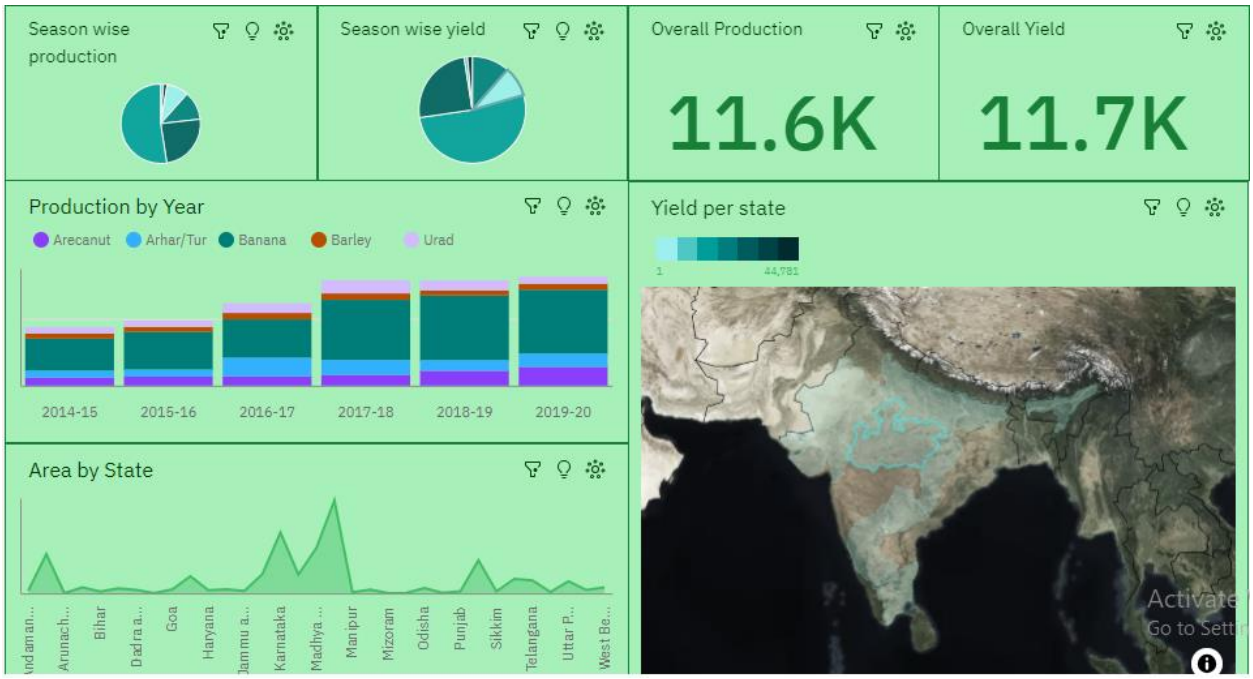
Dashboard

A dashboard is a graphical user interface (GUI) that displays information and data in an organized, easy-to-read format. Dashboards are often used to provide real-time monitoring and analysis of data and are typically designed for a specific purpose or use case.

Dashboards can be used in a variety of settings, such as business, finance, manufacturing, healthcare, and many other industries. They can be used to track key performance indicators (KPIs), monitor performance metrics, and display data in the form of charts, graphs, and tables.

Responsiveness and Design Of Dashboard

Creating an effective dashboard for analyzing agriculture in India and making strategic decisions based on population dynamics requires careful consideration of design principles and responsiveness to user needs. The dashboard should provide a user-friendly interface that offers actionable insights, facilitates data-driven decision-making, and accommodates diverse stakeholders involved in the agricultural sector.



Crops Included

Arecanut, arhar (pigeon pea), banana, barley, and urad (black gram)—holds its own significance in terms of cultivation and utilization:

Arecanut:

Arecanut is the fruit of the areca palm tree and is commonly chewed with betel leaves and lime. It holds cultural and social importance in various Asian countries, especially in India and parts of Southeast Asia. Arecanut cultivation is an important livelihood for many farmers. It's also used in traditional medicine and has some economic value due to its demand in various industries.

Arhar (Pigeon Pea):

Arhar is a legume that plays a crucial role in providing protein to many diets, particularly in South Asia and Africa. It's a staple in many cuisines and is often used to make dishes like dal. Apart from its nutritional value, pigeon pea plants also contribute to soil fertility through nitrogen fixation.

Banana:

Bananas are one of the most widely consumed fruits globally. They are rich in essential nutrients like potassium, vitamin C, and vitamin B6. Banana cultivation is relatively easy, making it a staple crop for many smallholder farmers. The plant's leaves are also used for various purposes, such as wrapping food, and in some cultures, they are used for religious ceremonies.

Barley:

Barley is a versatile cereal grain that has both food and fodder uses. It's used in various forms, such as whole grains, flour, and malt, and is utilized for making bread, soups, and alcoholic beverages. Barley cultivation is valuable in regions with cooler climates and shorter growing seasons.

Urad (Black Gram):

Urad is a type of lentil commonly used in Indian cuisine, especially for making dal. It's rich in protein and dietary fiber, making it a significant nutritional source, particularly for vegetarians. Urad cultivation also contributes to soil health due to its ability to fix nitrogen.

The cultivation of these crops has social, economic, and nutritional implications for communities around the world. They are often deeply embedded in traditional practices, local diets, and livelihoods. Additionally, sustainable cultivation practices and research into improving yield and resilience are important to ensure a consistent supply of these essential crops.

Challenges of cultivating

Some of the common challenges include:

Disease and Pest Management:

All these crops are susceptible to various diseases and pests that can significantly reduce yields. For example, banana plants can be affected by diseases like Panama disease and pests like the banana weevil. Effective disease and pest management strategies are crucial to prevent losses.

Climate Variability:

Changes in climate patterns, including unpredictable rainfall, temperature fluctuations, and extreme weather events, can impact the growth and yield of these crops. Banana cultivation, for instance, can be affected by cyclones and heavy rains, leading to crop damage.

Soil Health and Fertility:

Maintaining soil fertility is essential for healthy crop growth. Some crops, like barley and urad, can deplete soil nutrients. Proper soil management practices, including crop rotation and nutrient supplementation, are necessary to sustain yields.

Water Availability:

Water availability is a critical factor for successful cultivation. Some of these crops, such as arhar and barley, are sensitive to water stress. In regions with limited water resources or irregular rainfall, water-efficient irrigation techniques become crucial.

Market Access and Price Fluctuations:

Farmers often face challenges related to market access and price volatility. Sudden shifts in demand and supply can lead to price fluctuations, affecting the income of farmers who rely on these crops for their livelihoods.

Labor Shortages:

Labor shortages, particularly in rural areas, can impact the timely management of these crops. Banana cultivation, for instance, requires labor-intensive tasks such as planting, harvesting, and deleafing.

Land Degradation:

Unsustainable land use practices can lead to soil erosion and land degradation, affecting crop productivity. This is particularly relevant in areas with hilly terrain where crops like arecanut and barley are grown.

Changing Consumer Preferences:

As consumer preferences evolve, the demand for certain crops may change. Farmers need to adapt to these shifts to ensure that their cultivation remains economically viable.

Lack of Knowledge and Access to Technology:

Many farmers, especially smallholders, may lack access to modern agricultural techniques and technology. Proper training and access to information can help them adopt more efficient and sustainable practices.

Government Policies and Regulations:

Regulatory policies related to trade, subsidies, and land use can impact the cultivation of these crops. Favorable policies can promote cultivation, while unfavorable policies can create obstacles.

Addressing these challenges requires a combination of improved agricultural practices, research and innovation, farmer education and training, policy support, and collaboration between stakeholders across the agricultural value chain.

Strategic interventions

Improving the standard of living for the growing population in the context of these agricultural challenges requires a multi-pronged approach involving various stakeholders, including farmers, governments, researchers, and organizations. Here are some strategic interventions that can help address the challenges and enhance livelihoods:

Research and Technology Adoption:

Invest in research to develop disease-resistant and climate-resilient crop varieties. Promote the adoption of advanced farming techniques, such as precision agriculture, integrated pest management, and use of drought-resistant varieties, to improve yields and resource efficiency.

Capacity Building and Training:

Provide farmers with training programs that teach modern and sustainable agricultural practices. Focus on educating them about disease management, water-efficient irrigation, soil health management, and post-harvest techniques to reduce losses.

Access to Information:

Establish agricultural extension services that deliver up-to-date information and best practices directly to farmers. Use digital platforms, mobile apps, and local workshops to disseminate information on crop management, market trends, and weather forecasts.

Market Linkages and Value Addition:

Strengthen linkages between farmers and markets. Establish farmer cooperatives and agribusiness clusters that can collectively negotiate better prices, access credit, and engage in value addition activities such as processing and packaging.

Climate-Resilient Agriculture:

Promote climate-smart agricultural practices, such as agroforestry, cover cropping, and mixed cropping systems, which can enhance soil fertility, water retention, and biodiversity while reducing vulnerability to climate change.

Water Management:

Implement water-efficient irrigation systems such as drip irrigation and rainwater harvesting to ensure optimal water use. Encourage the use of drought-tolerant crop varieties and sustainable water management practices.

Financial Support and Insurance:

Provide farmers with access to affordable credit and crop insurance to mitigate risks associated with crop failure due to weather, pests, or diseases. Microfinance institutions can play a key role in this aspect.

Policy Support and Infrastructure:

Governments should formulate and implement supportive policies that encourage sustainable agricultural practices. Invest in rural infrastructure such as roads, storage facilities, and marketplaces to reduce post-harvest losses and improve market access.

Community-Based Approaches:

Foster community-led initiatives where farmers collaborate to address shared challenges. Establish farmer field schools, demonstration plots, and knowledge-sharing platforms to facilitate peer-to-peer learning.

Diversification and Value Chain Development:

Encourage diversification of crops and products. Develop strong value chains that link farmers to processors, retailers, and exporters, enabling them to capture a larger share of the value created.

Education and Awareness:

Raise awareness among consumers about the nutritional benefits and cultural significance of traditional crops. This can help create a demand for these crops and support their cultivation.

Research-Extension-Farmer Linkages:

Strengthen the connection between agricultural research institutions, extension services, and farmers. This collaborative approach ensures that research is relevant and directly benefits farmers.

By combining these interventions and tailoring them to the specific needs of each crop and region, it's possible to address the challenges of cultivation and improve the livelihoods of farmers while enhancing food security for the growing population.

Performance Testing

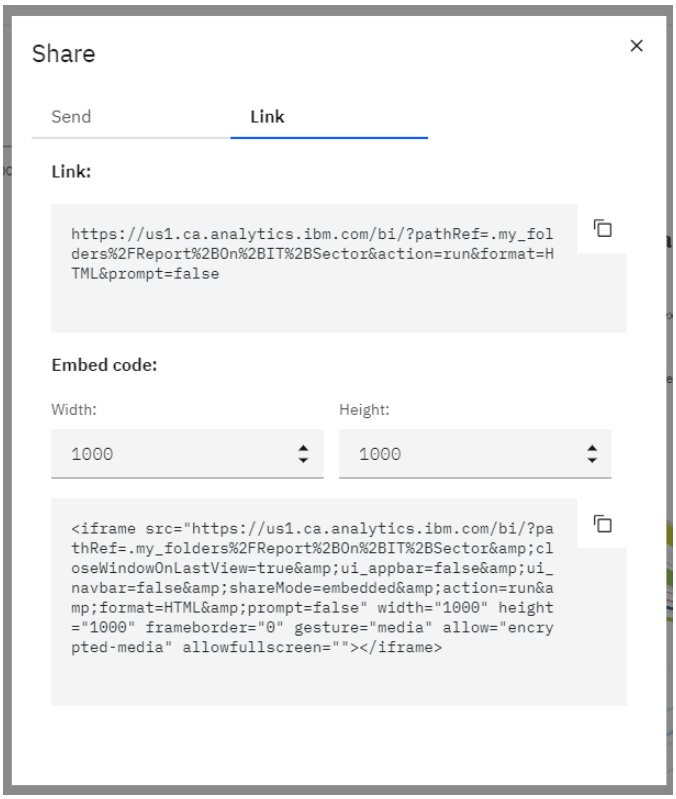
Performance testing for IBM Cognos focuses on evaluating the software's speed, responsiveness, and scalability under various conditions and workloads. It involves measuring and analyzing key performance indicators such as query response time, data loading speed, dashboard rendering time, and concurrent user handling capacity. The testing process helps identify any performance bottlenecks, optimize system configurations, and ensure that Tableau can handle the expected workload efficiently, providing users with a smooth and responsive experience while working with large datasets and complex visualizations.

Web Integration

Publishing helps us track and monitor key performance metrics, to communicate results and progress. Help a publisher stay informed, make better decisions, and communicate their performance to others.

Integrating dashboard/reports/stories to web

Step 1: Go to Dashboard/story/report, click on share button on the top ribbon



Note: You can also change the width and height of the dashboard/story/report as you like.

Advantages & Disadvantages:

Advantages :

Improved Decision Making: Data analytics empowers organizations to make data-driven decisions by providing meaningful insights. It enables businesses to identify trends, patterns, and relationships in data, helping them make informed choices and develop effective strategies.

Competitive Advantage: Organizations that effectively leverage data analytics gain a competitive edge. By analyzing customer behavior, market trends, and competitors' performance, businesses can identify opportunities, optimize operations, and develop innovative products and services.

Enhanced Efficiency and Productivity: Data analytics can identify inefficiencies, bottlenecks, and areas for improvement within an organization. By streamlining processes and optimizing resource allocation, businesses can enhance efficiency and productivity, leading to cost savings and increased profitability.

Disadvantages:

Data Privacy and Security Concerns: As data analytics relies on collecting and analyzing large volumes of data, privacy and security concerns arise. Mishandling of sensitive customer information or data breaches can lead to legal consequences, damage to reputation, and loss of customer trust.

Data Quality Issues: Data analytics heavily depends on the quality of data. Inaccurate, incomplete, or inconsistent data can lead to flawed insights and erroneous decision making. Organizations need to ensure data integrity, validate data sources, and implement proper data governance practices.

Resource Requirements: Implementing data analytics solutions requires substantial resources, including skilled personnel, advanced technology infrastructure, and data storage capabilities. Small or resource-constrained organizations may face challenges in effectively adopting and utilizing data analytics.

Applications Of Data Analytics:

Business and Marketing Analytics: Data analytics helps businesses understand customer behavior, preferences, and market trends. It enables them to optimize marketing campaigns, target specific customer segments, improve customer acquisition and retention, and enhance overall business performance.

Financial Analytics: Financial institutions use data analytics to analyze market trends, detect fraud, manage risks, and make informed investment decisions. It also aids in credit scoring, financial planning, and optimizing portfolio management.

Healthcare Analytics: Data analytics plays a crucial role in healthcare, facilitating patient monitoring, disease prediction, treatment optimization, and clinical decision support. It helps identify patterns in patient data, analyze medical records, and improve healthcare outcomes and operational efficiency.

Conclusion:

In conclusion, the exploration of analyzing agriculture in India and making strategic decisions based on population dynamics reveals a multifaceted landscape that intertwines the welfare of society, the growth of businesses, and the sustainability of the environment. The symbiotic relationship between agricultural practices and population needs is a pivotal factor in shaping the nation's future trajectory.

By aligning agricultural strategies with the evolving demands of a growing and diverse population, India stands to reap significant social, economic, and environmental benefits. The social impact is palpable through improved food security, enhanced nutritional health, empowered rural communities, and a heightened focus on environmental sustainability. These outcomes not only address present challenges but also lay the foundation for a more equitable and resilient society.

Future Scope:

Analyzing agriculture in India and making strategic decisions based on population dynamics holds significant potential for future advancements and exploration. As the landscape of agriculture, technology, and demographics continue to evolve, several avenues of future scope emerge:

Advanced Data Analytics: The integration of advanced data analytics, machine learning, and artificial intelligence can enhance the accuracy of predictions related to crop yields, demand patterns, and supply chain efficiency. This can lead to more precise decision-making based on real-time data.

Predictive Modeling: Developing predictive models that consider population growth, climate change, and consumer behavior can provide insights into long-term agricultural trends. These models can assist in formulating strategies for sustainable resource allocation.

Personalized Agriculture: Utilizing population data to tailor agricultural practices at an individual level has the potential to revolutionize food production. Precision agriculture could evolve to the point where each plot of land receives customized care based on population-centered demand.

Digital Platforms for Farmers: Expanding digital platforms that connect farmers directly with consumers can empower small-scale farmers and rural communities. Future developments may include mobile apps for price transparency, direct sales, and feedback mechanisms.

Blockchain and Supply Chain Transparency: Implementing blockchain technology for supply chain transparency can enhance traceability, ensure authenticity, and reduce fraud. This could empower consumers to make informed choices based on the origin and journey of agricultural products

APPENDIX

A. Source Code

Index(html):

```
<!DOCTYPE html>
<html lang="en">

<head>
  <meta charset="utf-8">
  <meta content="width=device-width, initial-scale=1.0" name="viewport">

  <title>ZUVA FarmXpert</title>
  <meta content="" name="description">
  <meta content="" name="keywords">

  <!-- Favicons -->
  <link href="static/assets/img/favicon.png" rel="icon">
  <link href="static/assets/img/apple-touch-icon.png" rel="apple-touch-icon">

  <!-- Google Fonts -->
  <link rel="preconnect" href="https://fonts.googleapis.com">
  <link rel="preconnect" href="https://fonts.gstatic.com" crossorigin>
  <link
href="https://fonts.googleapis.com/css2?family=Open+Sans:ital,wght@0,300;0,400;0,
500;0,600;0,700;1,300;1,400;1,600;1,700&family=Montserrat:ital,wght@0,300;0,400;0
,500;0,600;0,700;1,300;1,400;1,500;1,600;1,700&family=Raleway:ital,wght@0,300;0,4
00;0,500;0,600;0,700;1,300;1,400;1,500;1,600;1,700&display=swap"
rel="stylesheet">

  <!-- Vendor CSS Files -->
  <link href="static/assets/vendor/bootstrap/css/bootstrap.min.css"
rel="stylesheet">
  <link href="static/assets/vendor/bootstrap-icons/bootstrap-icons.css"
rel="stylesheet">
  <link href="static/assets/vendor/aos/aos.css" rel="stylesheet">
  <link href="static/assets/vendor/glightbox/css/glightbox.min.css"
rel="stylesheet">
  <link href="static/assets/vendor/swiper/swiper-bundle.min.css"
rel="stylesheet">

  <!-- Template Main CSS File -->
  <link href="static/assets/css/main.css" rel="stylesheet">
```

```
  <!-- ======================================================
  * Template Name: Impact
  * Updated: Jul 27 2023 with Bootstrap v5.3.1
  * Template URL: https://bootstrapmade.com/impact-bootstrap-business-website-template/
  * Author: BootstrapMade.com
  * License: https://bootstrapmade.com/license/
  ====================================================== -->
</head>

<body>

  <!-- ======= Header ======= -->
  <section id="topbar" class="topbar d-flex align-items-center">
    <div class="container d-flex justify-content-center justify-content-md-between">
      <div class="contact-info d-flex align-items-center">
        <i class="bi bi-envelope d-flex align-items-center"><a href="mailto:contact@example.com">harinarayanan945@gmail.com</a></i>
        <i class="bi bi-phone d-flex align-items-center ms-4"><span>+91 9360217915</span></i>
      </div>
      <div class="social-links d-none d-md-flex align-items-center">
        <a href="#" class="twitter"><i class="bi bi-twitter"></i></a>
        <a href="#" class="facebook"><i class="bi bi-facebook"></i></a>
        <a href="#" class="instagram"><i class="bi bi-instagram"></i></a>
        <a href="#" class="linkedin"><i class="bi bi-linkedin"></i></i></a>
      </div>
    </div>
  </section><!-- End Top Bar -->

  <header id="header" class="header d-flex align-items-center">

    <div class="container-fluid container-xl d-flex align-items-center justify-content-between">
      <a href="index.html" class="logo d-flex align-items-center">
        <!-- Uncomment the line below if you also wish to use an image logo -->
        <!-- <img src="assets/img/logo.png" alt=""> -->
        <h1>ZUVA<span>.</span></h1>
      </a>
      <nav id="navbar" class="navbar">
        <ul>
          <li><a href="#hero">Home</a></li>
          <li><a href="#about">About</a></li>
          <li><a href="#services">Dashboard</a></li>
```

```
          <li><a href="#portfolio">Portfolio</a></li>


          <li><a href="#contact">Contact</a></li>
        </ul>
      </nav><!-- .navbar -->

      <i class="mobile-nav-toggle mobile-nav-show bi bi-list"></i>
      <i class="mobile-nav-toggle mobile-nav-hide d-none bi bi-x"></i>

    </div>
  </header><!-- End Header -->
  <!-- End Header -->

  <!-- ======= Hero Section ======= -->
  <section id="hero" class="hero">
    <div class="container position-relative">
      <div class="row gy-5" data-aos="fade-in">
        <div class="col-lg-6 order-2 order-lg-1 d-flex flex-column justify-
content-center text-center text-lg-start">
          <h2>Welcome to <span>Zuva FarmXpert</span></h2>
          <p>The goal is to gain a thorough comprehension of the existing
condition of agriculture, recognize obstacles and prospects, and create strategic
measures to foster sustainable agricultural practices, boost productivity, and
elevate the quality of life for the expanding population.</p>
          <div class="d-flex justify-content-center justify-content-lg-start">
            <a href="#about" class="btn-get-started">Get Started</a>

          </div>
        </div>
        <div class="col-lg-6 order-1 order-lg-2">
          <img src="static/assets/img/hero-img.svg" class="img-fluid" alt=""
data-aos="zoom-out" data-aos-delay="100">
        </div>
      </div>
    </div>



    </div>
  </section>
  <!-- End Hero Section -->

  <main id="main">
```

```
    <!-- ======= About Us Section ======= -->
    <section id="about" class="about">
      <div class="container" data-aos="fade-up">

        <div class="section-header">
          <h2>About Us</h2>
          <p>Nurturing Growth: Cultivating Sustainable Agriculture for India's
Future</p>
        </div>

        <div class="row gy-4">
          <div class="col-lg-6">
            <h3> The systematic analysis of agricultural data and other
encompassing variables </h3>
            <img src="static/assets/img/about.jpg" class="img-fluid rounded-4 mb-
4" alt="">
            <p></p>
            <p></p>
          </div>
          <div class="col-lg-6">
            <div class="content ps-0 ps-lg-5">
              <p class="fst-italic">

Data analytics empowers stakeholders with valuable insights into agriculture,
revealing patterns, trends, and potential challenges for informed decision-
making.
              </p>

              <p>

Eager VIT students driving change in agriculture through insightful analysis and
strategic action.
              </p>

              <div class="position-relative mt-4">
                <img src="static/assets/img/about-2.jpg" class="img-fluid
rounded-4" alt="">
                <a href="https://www.youtube.com/watch?v=LXb3EKWsInQ"
class="glightbox play-btn"></a>
              </div>
            </div>
          </div>
        </div>

      </div>
```

```
    </section><!-- End About Us Section -->

    <!-- ======= Clients Section ======= -->
 <!-- End Clients Section -->

    <!-- ======= Stats Counter Section ======= -->

    <!-- ======= Call To Action Section ======= -->
    <section id="call-to-action" class="call-to-action">
      <div class="container text-center" data-aos="zoom-out">
        <a href="" class="glightbox play-btn"></a>
        <h3>Call To Action</h3>
        <p> This content calls for a comprehensive understanding of the current
state of agriculture and the challenges it faces. It urges readers to take action
by identifying obstacles like environmental issues and outdated practices. The
call to action is to adopt strategic measures such as sustainable farming
techniques, modern technologies, and resource optimization to overcome these
challenges. </p>
        <a class="cta-btn" href="#">Call To Action</a>
      </div>
    </section><!-- End Call To Action Section -->

    <!-- ======= Our Services Section ======= -->
    <section id="services" class="services sections-bg">
      <div class="container" data-aos="fade-up">

        <div class="section-header">
          <h2>Interactive Dashboard</h2>
          <iframe
src="https://us3.ca.analytics.ibm.com/bi/?perspective=dashboard&amp;pathRef=.my_f
olders%2FIBM%2BDashboard%2Bprogress&amp;closeWindowOnLastView=true&amp;ui_appbar=
false&amp;ui_navbar=false&amp;shareMode=embedded&amp;action=view&amp;mode=dashboa
rd&amp;subView=model000001897e9d2239_00000000" width="1400" height="800"
frameborder="0" gesture="media" allow="encrypted-media"
allowfullscreen=""></iframe>
        </div>

        <div class="row gy-4" data-aos="fade-up" data-aos-delay="100">

          <div class="col-lg-4 col-md-6">

          </div><!-- End Service Item -->

          <div class="col-lg-4 col-md-6">
```

```
          </div><!-- End Service Item -->

          <div class="col-lg-4 col-md-6">

          </div><!-- End Service Item -->

          <div class="col-lg-4 col-md-6">

          </div><!-- End Service Item -->

          <div class="col-lg-4 col-md-6">

          </div><!-- End Service Item -->

          <div class="col-lg-4 col-md-6">

          </div><!-- End Service Item -->

        </div>

      </div>
    </section><!-- End Our Services Section -->



    <!-- ======= Portfolio Section ======= -->


    <!-- ======= Our Team Section ======= -->

    <!-- ======= Contact Section ======= -->
    <section id="contact" class="contact">
      <div class="container" data-aos="fade-up">

        <div class="section-header">
          <h2>Contact</h2>
          <p>You can reach out to us anytime!</p>
        </div>

        <div class="row gx-lg-0 gy-4">

          <div class="col-lg-4">

            <div class="info-container d-flex flex-column align-items-center
justify-content-center">
```

```
              <div class="info-item d-flex">
                <i class="bi bi-geo-alt flex-shrink-0"></i>
                <div>
                  <h4>Location:</h4>
                  <p>Vellore Institute of Technology Chennai</p>
                </div>
              </div><!-- End Info Item -->

              <div class="info-item d-flex">
                <i class="bi bi-envelope flex-shrink-0"></i>
                <div>
                  <h4>Email:</h4>
                  <p>harinarayanan945@gmail.com</p>
                </div>
              </div><!-- End Info Item -->

              <div class="info-item d-flex">
                <i class="bi bi-phone flex-shrink-0"></i>
                <div>
                  <h4>Call:</h4>
                  <p>+91 9500400877</p>
                </div>
              </div><!-- End Info Item -->


            </div>

          </div>

          <div class="col-lg-8">
            <form action="forms/contact.php" method="post" role="form"
class="php-email-form">
              <div class="row">
                <div class="col-md-6 form-group">
                  <input type="text" name="name" class="form-control" id="name"
placeholder="Your Name" required>
                </div>
                <div class="col-md-6 form-group mt-3 mt-md-0">
                  <input type="email" class="form-control" name="email"
id="email" placeholder="Your Email" required>
                </div>
              </div>
              <div class="form-group mt-3">
                <input type="text" class="form-control" name="subject"
id="subject" placeholder="Subject" required>
```

```
              </div>
              <div class="form-group mt-3">
                <textarea class="form-control" name="message" rows="7"
placeholder="Message" required></textarea>
              </div>
              <div class="my-3">
                <div class="loading">Loading</div>
                <div class="error-message"></div>
                <div class="sent-message">Your message has been sent. Thank
you!</div>
              </div>
              <div class="text-center"><button type="submit">Send
Message</button></div>
            </form>
          </div><!-- End Contact Form -->

        </div>

      </div>
    </section><!-- End Contact Section -->

  </main><!-- End #main -->

  <!-- ======= Footer ======= -->
  <footer id="footer" class="footer">

    <div class="container">
      <div class="row gy-4">
        <div class="col-lg-5 col-md-12 footer-info">
          <a href="index.html" class="logo d-flex align-items-center">
            <span>Impact</span>
          </a>
          <p>
            We aim to comprehensively assess the current state of agriculture,
identify challenges and opportunities, and formulate strategic actions to promote
sustainable farming methods, enhance productivity, and improve the well-being of
the growing global population. This involves evaluating the present condition of
agricultural practices, understanding the hurdles faced, such as environmental
concerns, resource limitations, and outdated techniques. </p>
          <div class="social-links d-flex mt-4">
            <a href="#" class="twitter"><i class="bi bi-twitter"></i></a>
            <a href="#" class="facebook"><i class="bi bi-facebook"></i></a>
            <a href="#" class="instagram"><i class="bi bi-instagram"></i></a>
            <a href="#" class="linkedin"><i class="bi bi-linkedin"></i></a>
          </div>
```

```
      </div>

      <div class="col-lg-2 col-6 footer-links">
        <h4>Useful Links</h4>
        <ul>
          <li><a href="#">Home</a></li>
          <li><a href="#">About us</a></li>
          <li><a href="#">Services</a></li>
          <li><a href="#">Terms of service</a></li>
          <li><a href="#">Privacy policy</a></li>
        </ul>
      </div>

      <div class="col-lg-2 col-6 footer-links">
        <h4>Our Services</h4>
        <ul>
          <li><a href="#">Data Insights</a></li>
          <li><a href="#">Business Analytics</a></li>
          <li><a href="#">Sustainable Solution Provision</a></li>

        </ul>
      </div>

      <div class="col-lg-3 col-md-12 footer-contact text-center text-md-start">
        <h4>Contact Us</h4>
        <p>
           Vellore Institute of Technology Chennai<br>
          <br>
           <br><br>
          <strong>Phone:</strong>
          +91 9360217915<br>
          +919500400877<br>
          +917338886649<br>
          +918870107325<br>

          <strong>Email:</strong>
          harinarayanan945@gmail.com<br>
          santhanamoorthyuma@gmail.com<br>
          raaga.rajinikanth2020@vitstudent.ac.in<br>
          sutharsan.s2020@vitstudent.ac.in<br>
        </p>

      </div>

    </div>
```

```
    </div>

    <div class="container mt-4">
      <div class="copyright">
        &copy; Copyright <strong><span>Impact</span></strong>. All Rights
Reserved
      </div>
      <div class="credits">
        <!-- All the links in the footer should remain intact. -->
        <!-- You can delete the links only if you purchased the pro version. -->
        <!-- Licensing information: https://bootstrapmade.com/license/ -->
        <!-- Purchase the pro version with working PHP/AJAX contact form:
https://bootstrapmade.com/impact-bootstrap-business-website-template/ -->
         <a href="https://bootstrapmade.com/"></a>
      </div>
    </div>

  </footer><!-- End Footer -->
  <!-- End Footer -->

  <a href="#" class="scroll-top d-flex align-items-center justify-content-
center"><i class="bi bi-arrow-up-short"></i></a>

  <div id="preloader"></div>

  <!-- Vendor JS Files -->
  <script
src="static/assets/vendor/bootstrap/js/bootstrap.bundle.min.js"></script>
  <script src="static/assets/vendor/aos/aos.js"></script>
  <script src="static/assets/vendor/glightbox/js/glightbox.min.js"></script>
  <script src="static/assets/vendor/purecounter/purecounter_vanilla.js"></script>
  <script src="static/assets/vendor/swiper/swiper-bundle.min.js"></script>
  <script src="static/assets/vendor/isotope-layout/isotope.pkgd.min.js"></script>
  <script src="static/assets/vendor/php-email-form/validate.js"></script>

  <!-- Template Main JS File -->
  <script src="static/assets/js/main.js"></script>

</body>

</html>
```

Flask:

```
# Importing flask module in the project is mandatory
# An object of Flask class is our WSGI application.
from flask import Flask, redirect,url_for, render_template

# Flask constructor takes the name of
# current module (__name__) as argument.
app = Flask(__name__)

# The route() function of the Flask class is a decorator,
# which tells the application which URL should call
# the associated function.
@app.route("/")

# ‘/’ URL is bound with hello_world() function.
def main():
    return render_template(r"index.html")

# main driver function
if __name__ == '__main__':

    # run() method of Flask class runs the application
    # on the local development server.
    app.run(debug=False,port=8000)
```