

# Infosys Springboard Virtual Internship 6.0 Completion Report

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**Team Details :**

Batch Number:9

Start date:27/11/25

Names:Varshini Chintha

Internship Duration: 8 Weeks

**1. Project Title**

Intelligent Recipe Generator

**2. Project Objective**

The objective of this project is to design and develop an AI-based Intelligent Recipe Generator that can accurately identify ingredients from images or text inputs. The system analyzes the detected ingredients and matches them with a recipe database to recommend suitable dishes. It also provides clear, step-by-step cooking instructions using artificial intelligence. The overall goal is to make cooking easier, more efficient, and personalized for users.

**3. Project description in detail**

The Intelligent Recipe Generator is an advanced AI-driven application that combines Computer Vision, Machine Learning, Deep Learning, and Natural Language Processing to provide a smart and efficient cooking solution. The system is designed to assist users in identifying ingredients and generating suitable recipes with minimal effort.

Ingredient recognition is performed using deep learning-based Convolutional Neural Network (CNN) models that analyze images of raw or packaged food items uploaded by the user. In addition to image-based detection, Optical Character Recognition (OCR) techniques are used to extract ingredient information from food labels and packaged items, ensuring higher accuracy and flexibility in input methods.

Once the ingredients are identified, the system processes them through an intelligent recommendation engine. This engine compares the available ingredients with a structured recipe database and calculates similarity scores to recommend the most relevant recipes.

The recommendations can also be refined based on user preferences, dietary restrictions, cooking time, and nutritional requirements.

To enhance user experience, Natural Language Processing (NLP) models are integrated to generate clear, step-by-step cooking instructions in an easy-to-understand format. This makes the application suitable for beginners as well as experienced cooks. Overall, the Intelligent Recipe Generator functions as a real-world smart cooking assistant that improves convenience, reduces food waste, and promotes healthier cooking practices.

#### 4. Timeline Overview

| Week   | Activities Planned                                | Activities Completed  |
|--------|---|---|
| Week 1 | Project setup, requirement analysis, and planning | The project requirements were carefully analyzed and finalized. The overall system architecture was planned, and suitable tools, technologies, and frameworks were selected. The development environment was set up by installing required libraries and configuring the project structure. |
| Week 2 | Learning image processing concepts and CNN basics | Image processing fundamentals and Convolutional Neural Networks (CNNs) were studied in detail. Various CNN architectures and image preprocessing techniques such as resizing and normalization were understood to prepare for ingredient recognition.                                       |
| Week 3 | Ingredient recognition implementation             | CNN-based deep learning models were implemented to recognize ingredients from user-uploaded images. Initial testing was conducted to verify the accuracy and performance of the ingredient detection module.  |

|        |   |   |
|--------|---|---|
| Week 4 | OCR integration and backend API development | Optical Character Recognition (OCR) was integrated to extract ingredient names from packaged food labels and text inputs. Backend RESTful APIs were developed to handle image uploads, process data, and return ingredient information. |
| Week 5 | Database design and recipe data collection  | A structured database was designed to store recipes, ingredients, cooking instructions, and nutritional details. Recipe datasets were collected, cleaned, standardized, and successfully populated into the database.                   |
| Week 6 | Recipe recommendation system development    | An intelligent recipe recommendation system was implemented to match identified ingredients with suitable recipes. The system calculates ingredient similarity and suggests the most relevant recipes.                                  |
| Week 7 | UI development and system integration       | A responsive and user-friendly interface was designed for ingredient input and recipe display. The frontend was fully integrated with backend services to ensure smooth data flow across the system.                                    |
| Week 8 | Testing, optimization, and deployment       | Comprehensive testing was performed to ensure system accuracy and reliability.  |

### 5a. Key Milestones

| Milestone       | Description   | Date Achieved |
|-----------------|---|---------------|
| Project Kickoff | Project idea finalized and development plan created | 27/11/25      |

|                       |  |          |
|-----------------------|--|----------|
| Prototype/First Draft | Initial prototype for ingredient detection and recipe output | 29/11/25 |
| Mid-Term Review       | Review of OCR, database, and recommendation modules          | 11/12/25 |
| Final Submission      | Complete system with UI, backend, and recommendation engine  | 24/12/25 |
| Presentation          | Project demonstration and explanation to evaluators          | 16/1/26  |

### 5b. Project execution details

The project was executed in a systematic and step-by-step manner, beginning with a clear understanding of the problem statement and defining the project objectives. Proper planning was carried out to divide the system into smaller, manageable modules, which made development and integration more efficient. The required tools, technologies, and development environment were set up at an early stage to support smooth implementation.

Image processing techniques and Optical Character Recognition (OCR) were applied to extract ingredient information from user-provided images and text inputs. Each module, including ingredient recognition, backend processing, database operations, and frontend interaction, was developed and tested individually to ensure correctness and reliability.

After successful module-level testing, all components were carefully integrated to form a complete system. Final testing was conducted to validate overall functionality, performance, and user experience. The project was successfully completed with all planned features working as expected, resulting in a reliable and user-friendly Intelligent Recipe Generator.

## 6. Snapshots / Screenshots

The screenshot shows a code editor with the following project structure:

```

INTELLIGENT RECIPE GENERATOR
├── frontend
│   ├── int_db.py
│   ├── database_models.py
│   ├── Login.css
│   ├── OAuthCallback.js
│   ├── Profiles.js
│   └── App.js
├── static
└── README.md

```

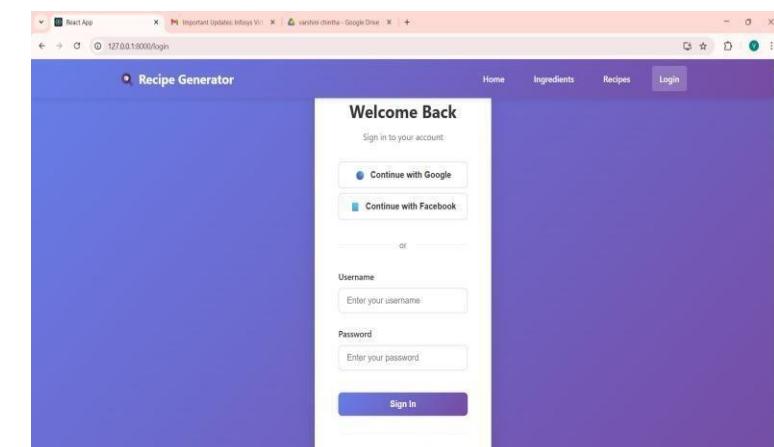
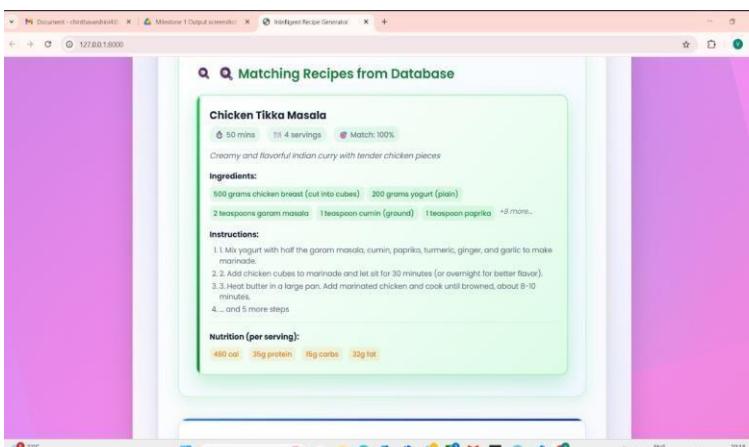
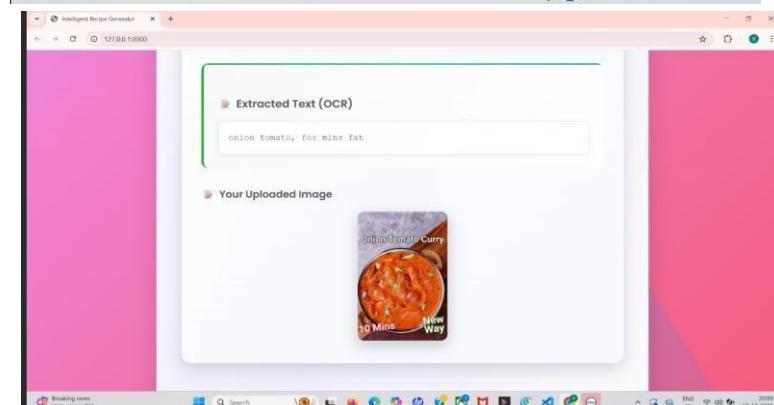
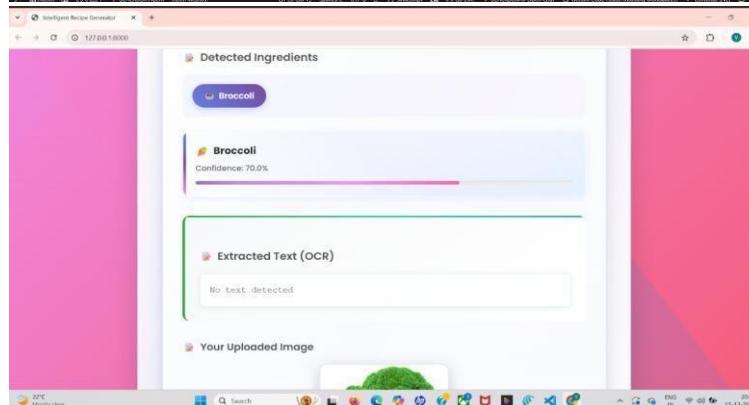
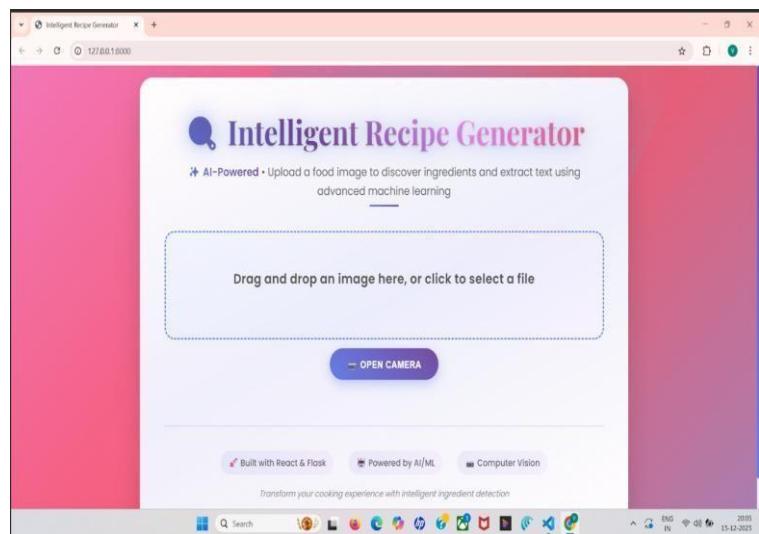
Content of App.js:

```

import React from 'react';
import { BrowserRouter as Router, Routes, Route } from 'react-router-dom';
import Home from './pages/home';
import Ingredients from './pages/ingredients';
import Recipes from './pages/recipes';
import RecipeDetail from './pages/RecipeDetail';
import Profile from './pages/profile';
import Login from './pages/login';
import OAuthCallback from './pages/OAuthCallback';
import App.css;

```

Profile management



## 7. Challenges Faced

One of the major challenges faced during the project was achieving accurate ingredient detection from images, especially under varying lighting conditions, image quality, and background noise. Additionally, extracting clean and reliable text from packaged food labels using OCR was difficult due to font variations, reflections, and low-resolution images.

These challenges were addressed by applying effective image preprocessing techniques such as resizing, normalization, and noise reduction. OCR accuracy was improved through text cleaning and optimization methods. Continuous testing and fine-tuning helped enhance the overall performance and reliability of the system.

## 8. Learnings & Skills Acquired

Through this project, strong practical skills were gained in Python programming and backend development. Hands-on experience was acquired in Machine Learning, Deep Learning, and Natural Language Processing, particularly in implementing CNN models for image recognition and NLP techniques for instruction generation. The project also provided experience in developing RESTful APIs, handling databases, and integrating frontend and backend systems. Additionally, knowledge of cloud deployment, version control, and overall system integration was strengthened.

## 9. Testimonials from team

The project enhanced teamwork, technical skills, and confidence. Working on this project significantly enhanced our teamwork and collaboration skills. It provided valuable hands-on experience with modern technologies and improved our technical understanding. The project also increased our confidence in designing, developing, and deploying real-world AI-based applications.

## 10. Conclusion

The Intelligent Recipe Generator successfully demonstrates how artificial intelligence can be applied to real-world problems like cooking and meal planning. By integrating image processing, deep learning, recommendation systems, and natural language processing, the project delivers a smart, scalable, and user-friendly solution. It enhances convenience, reduces food waste, and promotes healthier cooking habits. Overall, the project highlights the practical potential of AI in everyday life and provides a strong foundation for future enhancements and real-world deployment.

## 11. Acknowledgements

We sincerely thank **Infosys Springboard** for providing this opportunity to work on an innovative project. We are also grateful to our **mentors and guides** for their continuous support, valuable guidance, and constructive feedback throughout the development of this project. Their insights greatly contributed to the successful completion of the Intelligent Recipe Generator.