**Batch: A-3 Roll No.: 16010122104**

**Experiment No : 05**

**Group No:**

|  |
| --- |
| **Title: Chapter No:05 Prototype Implementation for the Mini-Project.** |

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Expected Outcome of Experiment:**

**CO3: Implement and prototype creation for the specified application.**

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Books/ Journals/ Websites referred:**

*[Students can mention websites/ books used in their project implementation]*

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**This write up will expect students to prepare chapter no 5 in the format given below**

**Chapter 5**

**Implementation and Development of the Prototype**

*This chapter details the implementation process of the proposed prototype/application, outlining the development environment, tools, and technologies utilized. It describes the step-by-step approach taken to transform the conceptual design into a functional system. The implementation methodology, including coding standards, frameworks, and system architecture, is discussed in detail. Key challenges encountered during development and their corresponding solutions are also highlighted. Finally, the chapter concludes with an overview of the system’s functionality and its readiness for testing and evaluation.*

**Introduction:**

The implementation phase translates the system architecture and analysis into a working prototype. In our project, we integrated deep learning and image processing components to accurately detect, classify, and manage crop diseases. The prototype was built by combining several modules that address image preprocessing, disease classification, and user interaction, ensuring that stakeholder requirements are met and system performance can be validated.

**Integration:**

| **Module Name** | **Description** | **Input(s)** | **Output(s)** | **Scenario** |
| --- | --- | --- | --- | --- |
| **Image Preprocessing Module** | **Processes raw images by applying noise reduction, normalization, and resizing algorithms to prepare them for further analysis.** | **Raw crop leaf images** | **Preprocessed images suitable for deep learning model input** | **Field images captured under varying lighting conditions** |
| **Disease Classification Module** | **Utilizes a convolutional neural network (e.g., ResNet variants or RexNet‑150) to identify diseases from preprocessed images and generate prediction scores.** | **Preprocessed images** | **Predicted disease label with confidence score and management recommendations** | **Image analysis triggered by user upload through the web interface** |
| **User Interface Module** | **Provides a web-based interface that allows users to upload images and view real‑time diagnostic results and disease management advice.** | **User‑submitted images** | **Visual feedback including prediction results, confidence levels, and suggestions** | **Interaction via mobile or desktop application** |
| **Integration Module** | **Manages data flow between different modules, ensures compatibility and version control, and handles overall error logging and system monitoring.** | **Outputs from all individual modules** | **Consolidated system responses along with logging details** | **Real‑time system operation where data from multiple modules is unified** |

