**CSE 499A (Section 4)**

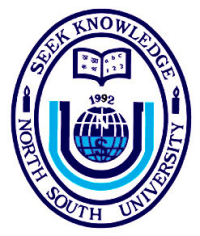
**Design Report (CO2)**

**Project Title:** Plant Diseases Detection Using Image Processing

**Submitted To**

**Dr. Shazzad Hosain (SZZ)**

**Date: 5/12/2024**



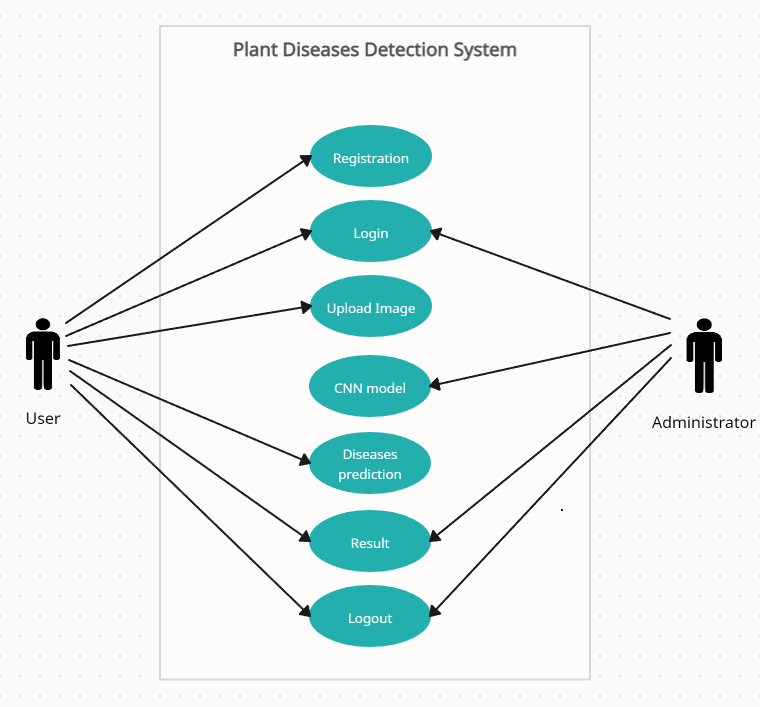
**Semester: Summer 24**

**Group No: G-3**

**Group Members**

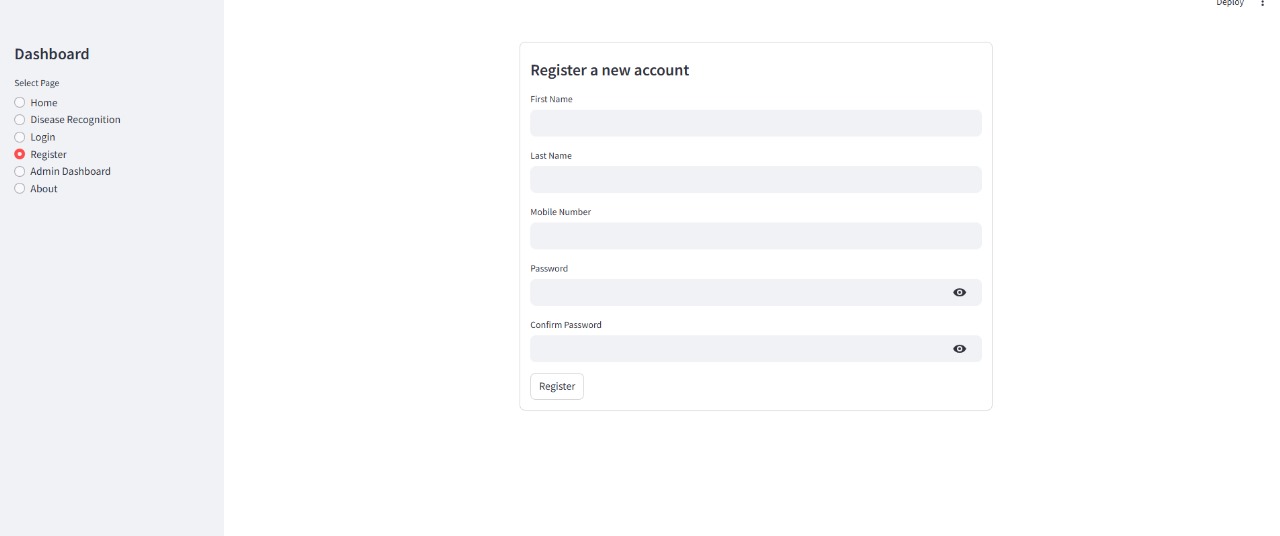
|  |  |
| --- | --- |
| **ID** | **Name** |
| 2011892042 | Akib Hasan |
| 2012464042 | Abroor Zahin Niloy |
| 2011566042 | Tania Akter Lima |
| 2012959042 | Naima Homaira Khan |

1. **Use Case Diagram**

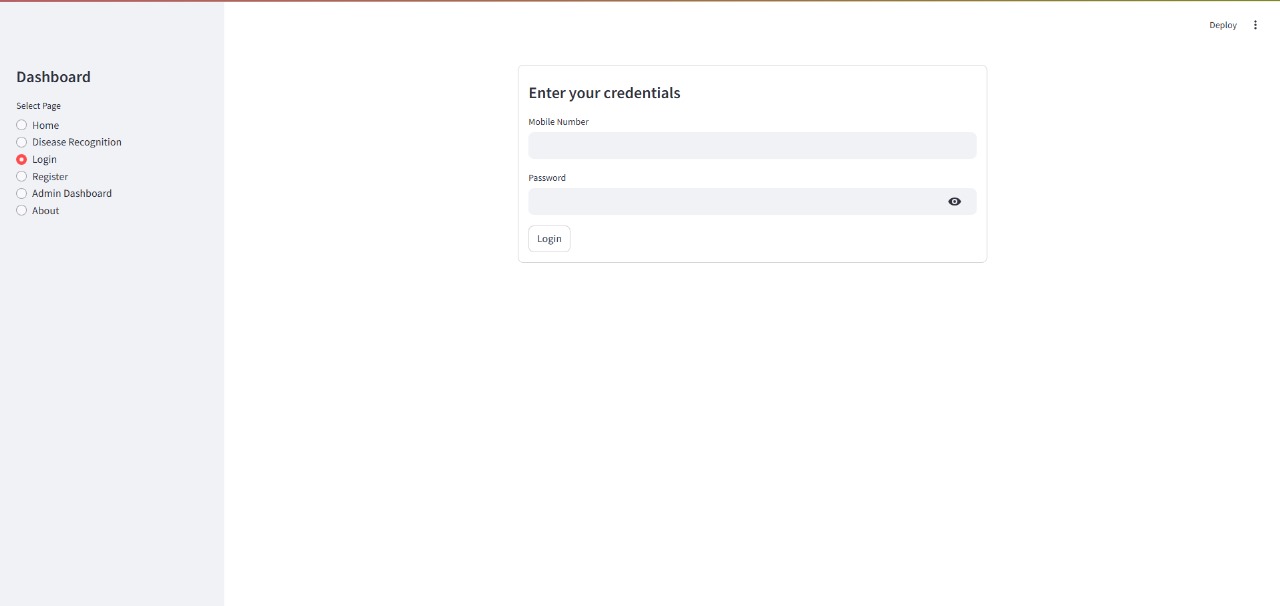
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1. **UX Designs**

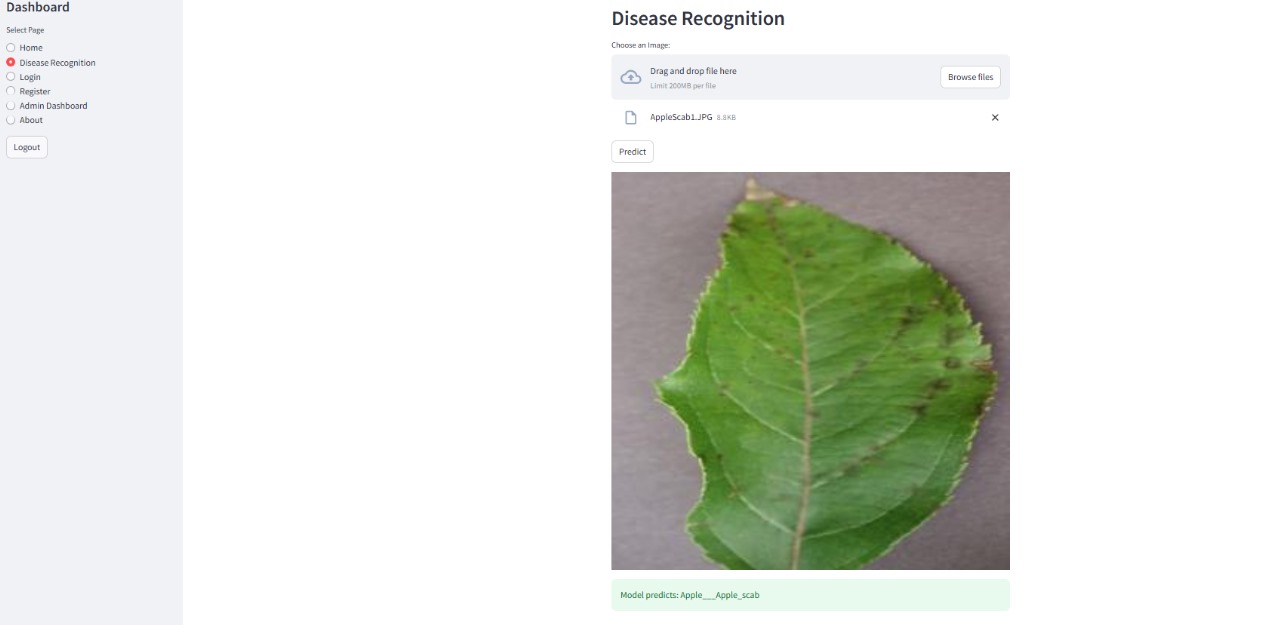
**Registration:**

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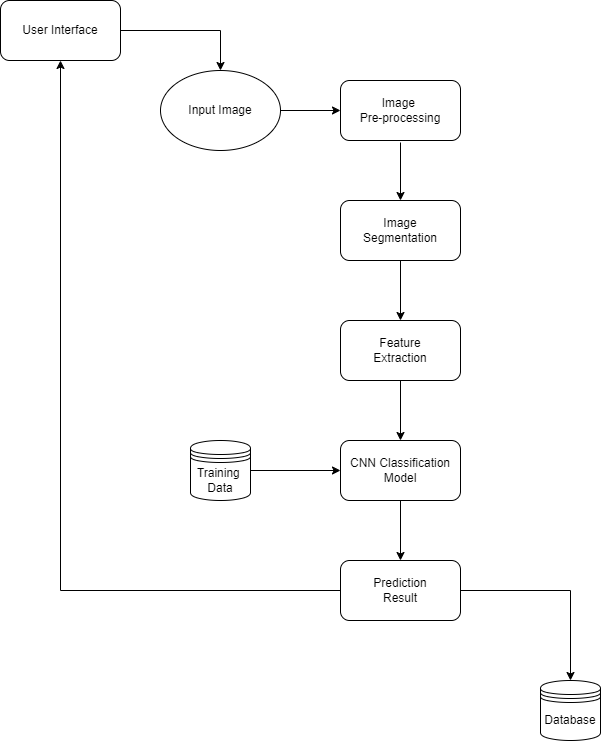
**Login:**



**Disease recognition:**

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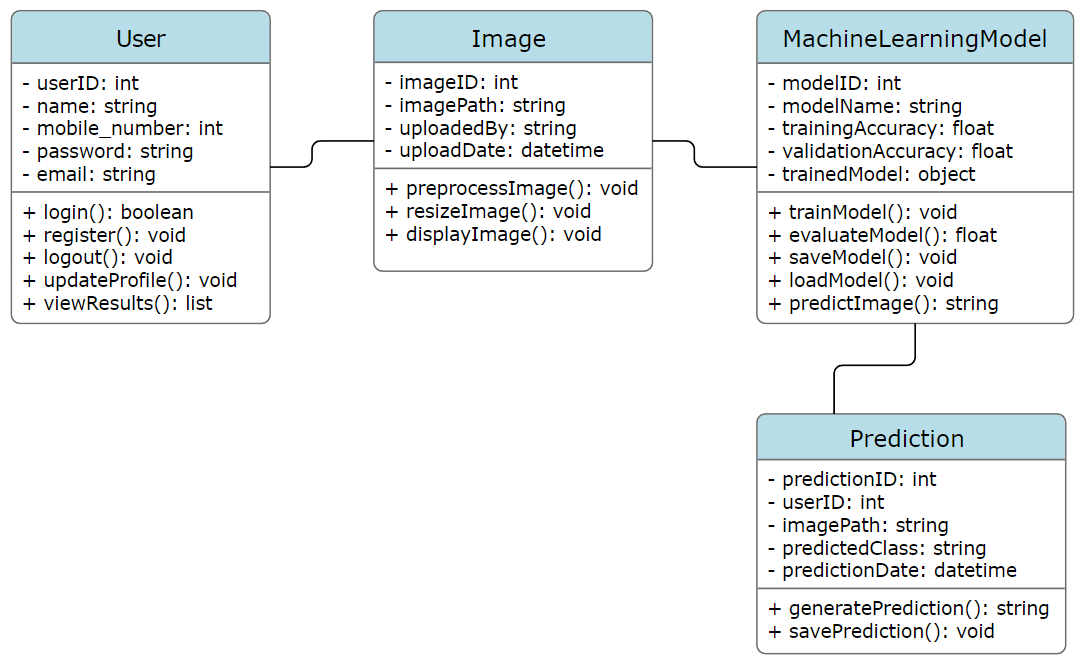
1. **System Designs**



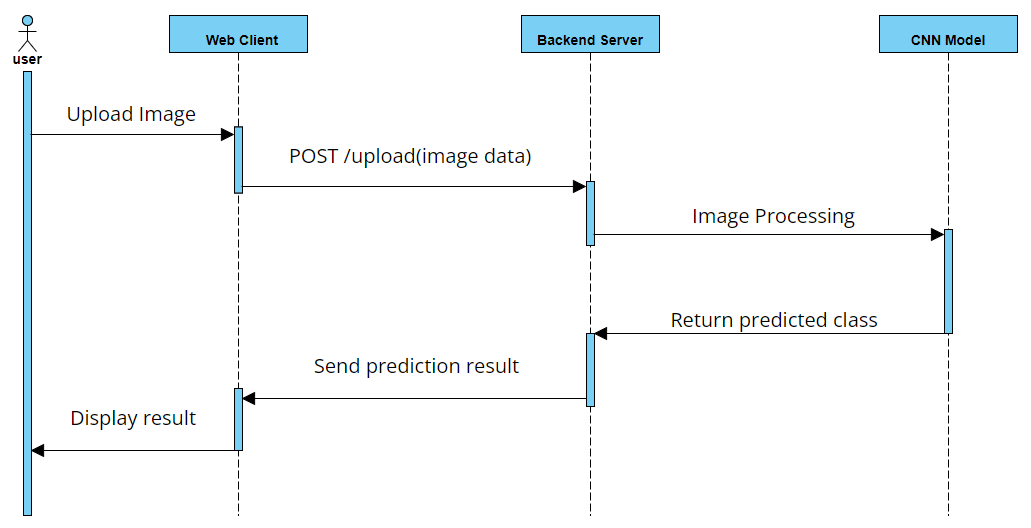
1. **Database design / Hardware Component Description**

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1. **Class diagram**



**sequence diagram**

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1. **Relevant equations and algorithms**

* **Preprocessing:**

**Image Resizing**: Ensures all input images are uniform in size.



Implemented using libraries like TensorFlow or OpenCV (tf.image.resize or cv2.resize).

**Normalization**: Scales pixel values to the range [0,1][0, 1][0,1]:

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* **Convolutional Neural Network (CNN)**

**Convolution Operation**:

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**Activation Function:**



**Pooling**: Max pooling is common for reducing feature map size:



**Fully Connected Layer**: Converts extracted features into class probabilities using:

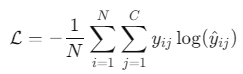


**Dropout**: Prevents overfitting by randomly zeroing ppp fraction of neurons:

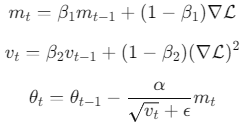


* **Training**

**Loss Function**: **Categorical Crossentropy** for multi-class classification:

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**Optimization Algorithm**: Likely **Adam Optimizer**:

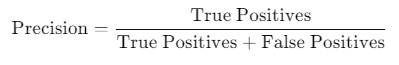
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* **Evaluation Metrics**

**Accuracy**:

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**Precision:**

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**Recall:**

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**F1-Score:**

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