[1. Conceptual Model and Technical Design 1](#_Toc181360493)

### Hypothesis

* This model will be built using only **Tomato, Potato and Bell Pepper** Images only as in the publicly available dataset.
* This model will process only selected types of diseases in above mentioned plant leaves.

[1. Problem Formulation 1](#_Toc181360494)

**Research Question**

**“How can Convolutional Neural Networks (CNN) be applied to accurately and efficiently detect crop diseases from leaf images to minimize yield losses and improve agricultural sustainability?”**

[2. Data Collection 2](#_Toc181360495)

Link to the publicly available data set - <https://www.kaggle.com/datasets/emmarex/plantdisease/data>

**A graph of different types of food

Description automatically generatedData Exploration**

A screen shot of a computer

Description automatically generated

A green leaf with black spots

Description automatically generatedExample Images of the dataset

A green leaf on a grey surface

Description automatically generated

A green leaf on a grey surface

Description automatically generated

A computer screen shot of a program

Description automatically generated

A screen shot of a computer code

Description automatically generated

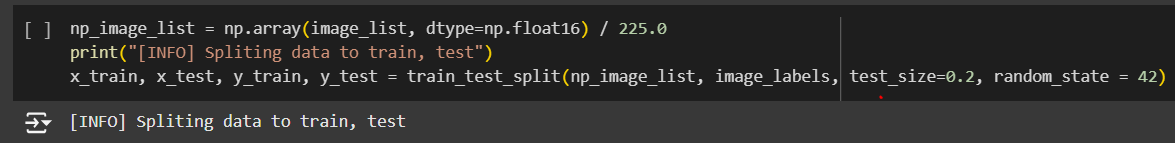
A screen shot of a computer code

Description automatically generated

[3. Data Preprocessing Exploration 2](#_Toc181360496)

A screen shot of a computer program

Description automatically generated



A screen shot of a computer code

Description automatically generated

[4. Model Building and Validation 2](#_Toc181360497)

Model Training

A screenshot of a computer program

Description automatically generated

Model Validating

A screenshot of a computer

Description automatically generated

A graph with red and blue lines

Description automatically generatedA graph with a line and a red line

Description automatically generated

Model Testing

A screen shot of a computer screen

Description automatically generated

[5. Model Deployment and Monitoring 2](#_Toc181360498)

A hand holding a cell phone

Description automatically generatedDeployment – Using an app

(app interface)

Monitoring Plan

A close-up of a chart

Description automatically generated

(write like this, give the same tools and ideas using your words)