PROJECT REPORT

FERTILIZERS RECOMMENDATION SYSTEM FOR DISEASE PREDICTION

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INTRODUCTION:

The main goal of "FERTILIZERS RECOMMENDATION SYSTEM FOR DISEASE PREDICTION" is to assist farmers with the technological support. Agriculture is the most important sector in today's life. Most plants are affected by a wide variety of bacterial and fungal diseases.

PROJECT OVERVIEW:

An automated system is introduced to identify different diseases on plants by checking the symptoms shown on the leaves of the plant. Deep learning techniques are used to identify the diseases and suggest the precautions that can be taken for those diseases. Just upload the pictures of a leaf infested and the AI system of the app will detect the disease. After the disease identification contact the local agricultural expert for help.

PURPOSE:

- To study the influence of weather parameters
- Effect of new cropping pattern
- To connect farmers globally by community formation
- To know the status of existing and new pest species
- Alerts for earlier prevention on pest spread

LITERATURE SURVEY:

EXISTING PROBLEM:

Adequate mineral nutrition is central to crop production. However, it can also exert considerable Influence on disease development.

Fertilizer application can increase or decrease development of diseases caused by different pathogens, and the mechanisms responsible are complex, including effects of nutrients on plant growth, plant resistance mechanisms and direct effects on the pathogen. The effects of mineral nutrition on plant disease and the mechanisms responsible for those effects have been dealt with comprehensively elsewhere. In India, around 40% of land is kept and grown using reliable irrigation technologies, while the rest relies on the monsoon environment for water. Irrigation decreases reliance on the monsoon, increases food security, and boosts agricultural production.

Most research articles use humidity, moisture, and temperature sensors near the plant's root, with an external device handling all of the data provided by the
sensors and transmitting it directly to an Android application.

It was created to measure the approximate values of temperature, humidity and moisture sensors that were programmed into a microcontroller to manage the amount of water.

REFERENCES:

- **Reyes Angie .K, Juan C. Caicedo,and Jorge E. Camargo, "Fine-tuning Deep Convolutional Networks for Plant Recognition", In CLEF (WorkingNotes), 2015.**

- **Hamrouni .L, Aiadi .O, Khaldi .B and Kherfi .M.L, "Plants Species Identification using Computer Vision Techniques", Revue des Bioressources 7, no. 1,2018.**

- **Naresh, Y. G., and H. S. Nagendraswamy, "Classification of medicinal plants: an approach using modified LBP with symbolic representation", Neurocomputing 173, pp: 1789-1797, 2016.**

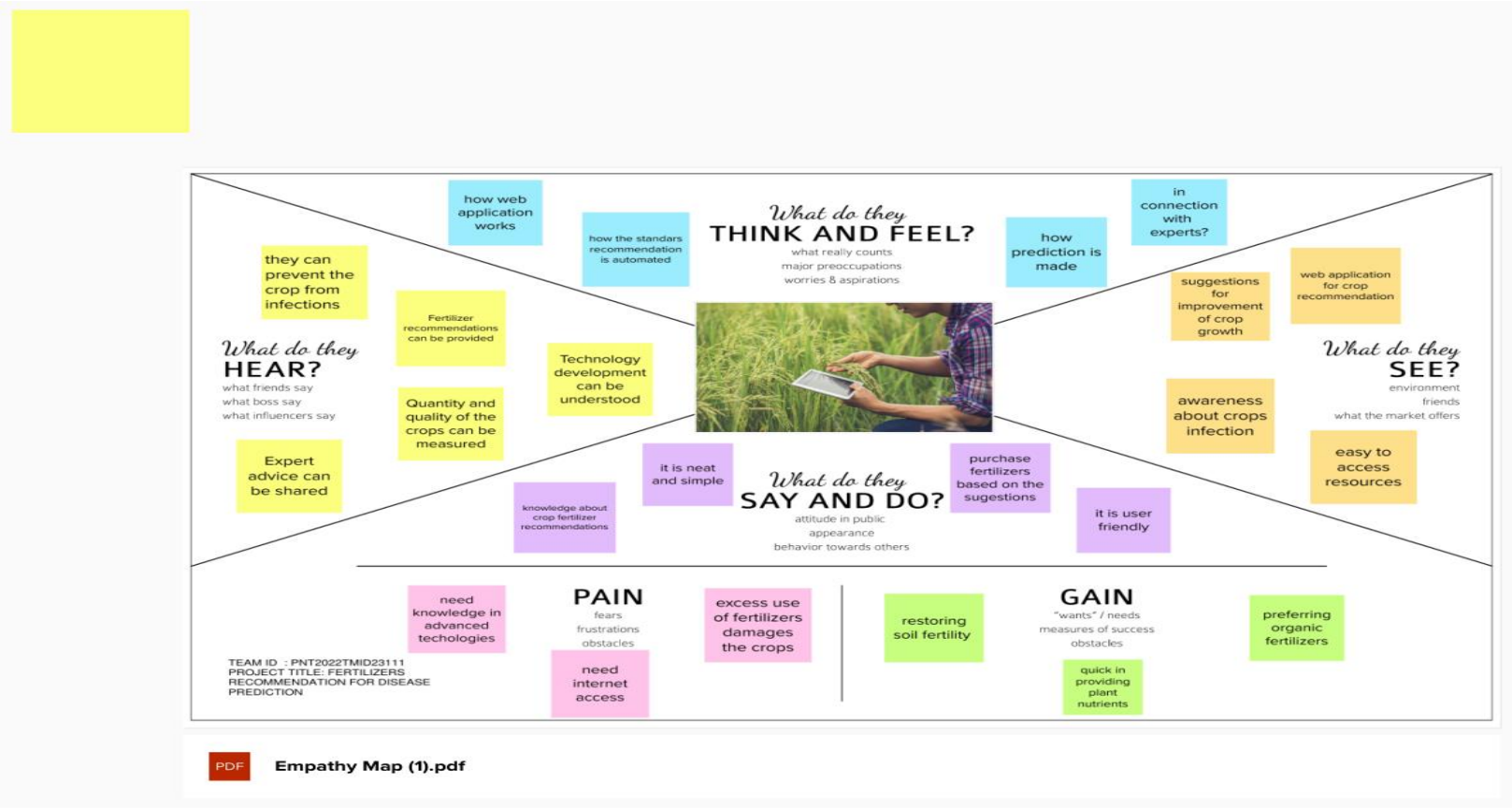
PROBLEM STATEMENT DEFINITION :

The solution to the problem is Machine learning, which is one of the applications of Artificial Intelligence, is being used to implement the proposed system.
Crop recommendation is going to recommend you the best crop you can grow in your land as per the soil nutrition value and along with as per the climate in that
region. And recommending the best fertilizer for every particular crop is also a challenging task. And the other and most important issue is when a plant gets
caught by heterogeneous diseases that effect on less amount of agriculture production and compromises with quality as well. To overcome all these issues this
recommendation has been proposed .

Nowadays a lot of research and work is being implemented in the smart and modern agriculture domain. Crop recommendation is characterized by a soil database
comprised of Nitrogen, Phosphorus, potassium. The ensembles technique is used to build a recommendation model that combines the prediction of multiple
machine learning. Models to recommend the right crop based on soil value and the best fertilizer to use.

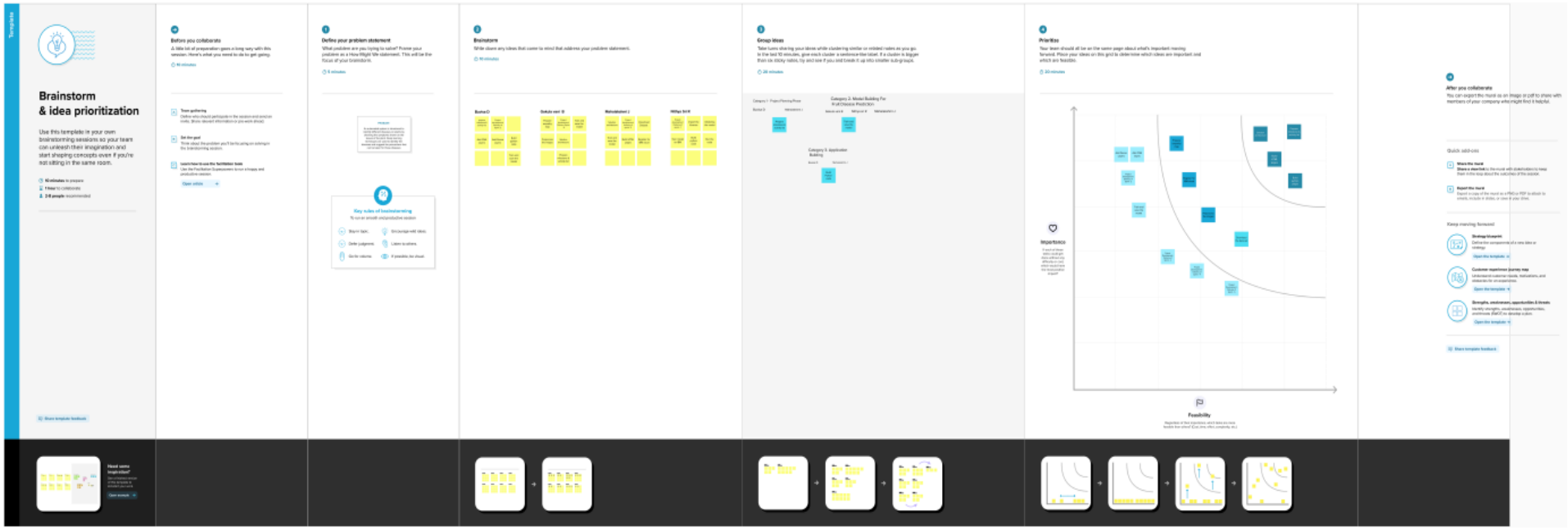
IDEATION & PROPOSED SOLUTION :

Empathy Map :



PDF **Empathy Map (1).pdf**

Brain Stroming :



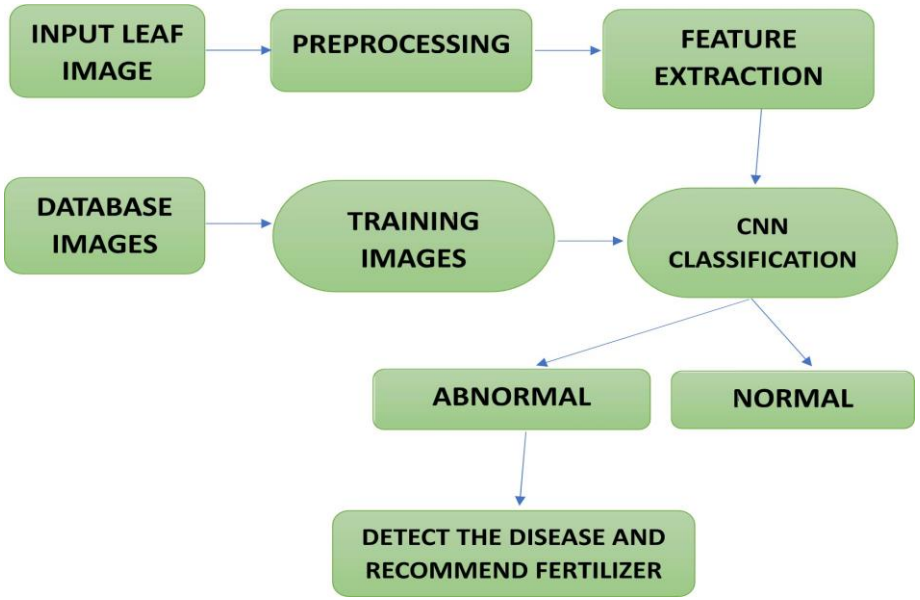
Proposed Solution :

●The idea of the proposed solution uses Deep learning and Machine algorithm to classify leaves and identify the diseases and siggest the fertilizers. The deep
learning process includes the MobileNetV2 and VGG19 training Models.
● Based on the leaf disease detected , the model recommendation for fertilizers for the prevention. The farmers and researchers are the end users get benefied by
the system.
● More accurate in others. The system is more robust corporating more image data sets with wider variations. This system also estimates the probability of infected
plant.
● Plant growth can be enhanced. Ensure plants are getting supplied with every nutrient they need also and multiple cross in grow in every yields for every season. It
also helps people nutritional needs.

Problem Solution Fit

● This Learn and Build phase has proven to be the most important, parallel phase that successful startups follow. It contains the very first activity that startups
should follow if they have an idea: Find prospective customers to talk to. Usually, this idea is already translated to a software product, which should always be a
Minimum Viable Product (MVP) a version of the product that requires the least amount of development time with a minimum amount of effort.
● An MVP is based on requirements desired by potential customers, but to obtain these requirements, the startup should talk as early as possible with those
customers. The startup then requires to prioritise the ‘must haves’, which are the minimum necessary requirements for the MVP. Once the MVP is ready for
customer feedback, the second most important activity is performed by the startup foreveryone.

PROJECT DESIGN :



PLANNING & SCHEDULING :

Sprint Planning and Estimation

Sprint	Functional Require	User Story N	User Story / Task	Story Po	Priority	Team Members
Sprint-1	Data Collection	USN-1	As a user, I can collect the dataset from va with different leaves which is affected by va	10	Low	BUVISA D GOKULA VANI B
Sprint-1	Data Preprocessing	USN-2	As a user, I can load the dataset, handlir data, scaling and split data into train and test	10	Medium	MAHALAKSHMI J NITHYA SRI R
Sprint-2	Model Building	USN-3	As a user, I will get an application with DI provides high accuracy of fertilizer re system.	5	High	BUVISA D GOKULA VA MAHALAKSHMI J NITHYA SRI R
Sprint-2	Add CNN layers	USN-4	Creating the model and adding the inpu output layers to it.	5	High	NITHYA SRI R MAHALAKSHMI J GOKULA VANI B

Sprint	Functional Require	User Story N	User Story / Task	Story Poi	Priority	Team Members
Sprint-2	Compiling the model	USN-5	With both the training data defined and mod time to configure the learning process.	2	Medium	BUVISA D
Sprint-2	Train & test the mod	USN-6	As a user, let us train our model with our im	6	Medium	BUVISA D NITHYA SRI R GOKULA VANI B MAHALAKSHMI J
Sprint-2	Save the model	USN-7	As a user, the model is saved & integrated v application or web application in ord something.	2	Low	MAHALAKSHMI J BUVISA D
Sprint-3	Building UI Applicat	USN-8	As a user, I will upload the disease affecte the application by clicking a uploadbutton.	5	High	GOKULA VANI B NITHYA SRI R
Sprint-3		USN-9	As a user, I can know the details of the func of the application.	5	Low	GOKULA VANI B MAHALAKSHMI J
Sprint-3		USN-10	As a user, I can see the predicted / fertilizers in the application.	5	Medium	NITHYA SRI R BUVISA D

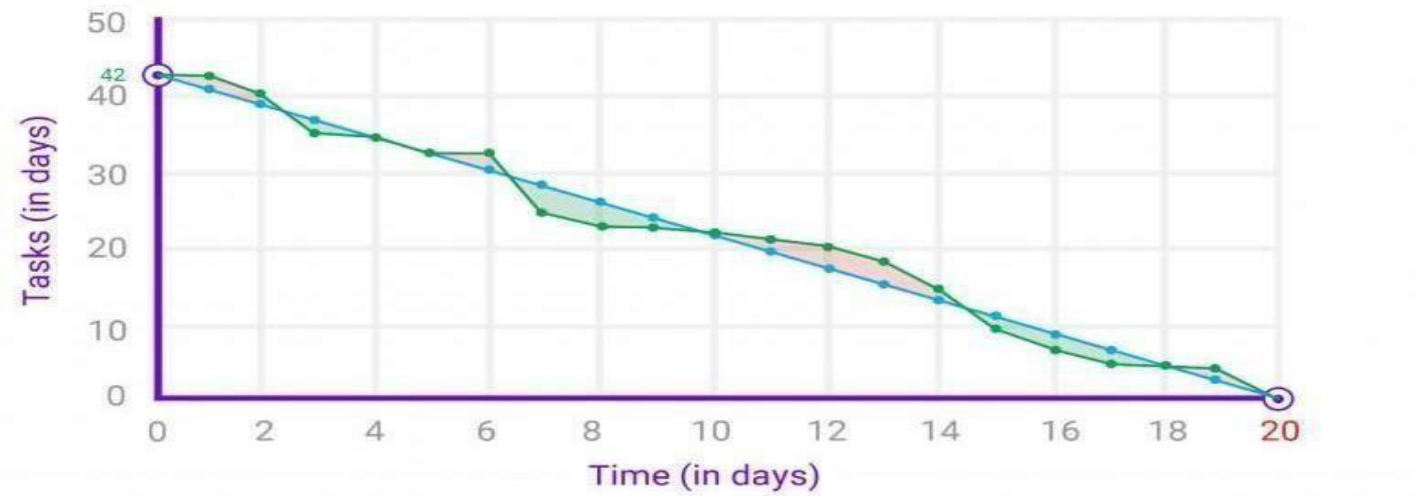
Sprint-4	Train the model on I	USN-11	As a user, I train the model on IBM and inte	10	High	NITHYA SRI R MAHALAKSHMI J
Sprint-4	Cloud Deployment	USN-12	As a user, I can access the web application use of the product from anywhere.	10	High	GOKULA VANI B BUVISA D

Project Tracker, Velocity, Burndown Chart:

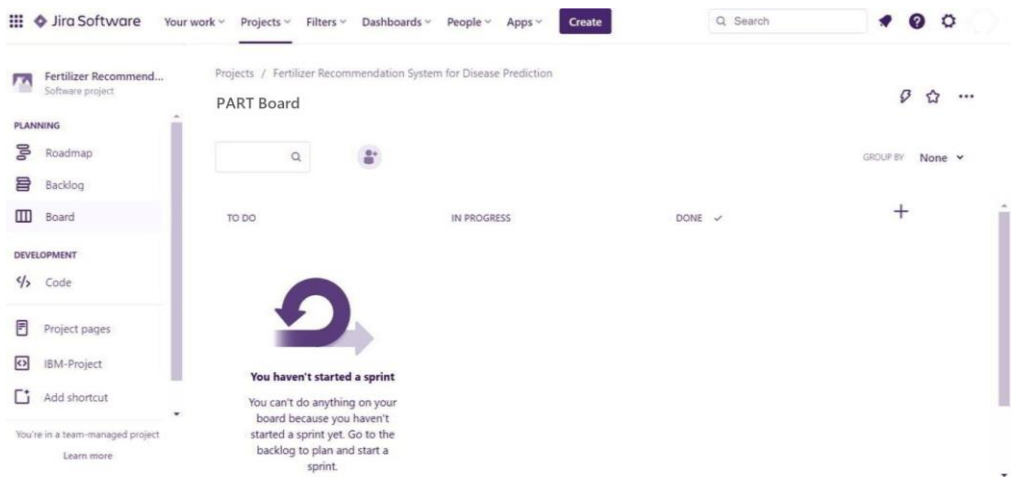
Sprint	**Total Story P**	**Duration**	**Sprint Start Date**	**Sprint End Date (P**	**Story Points Con Planned End Dat**	**Sprint Release Date (A**
Sprint-1	20	6 Days	24 Oct 2022	29 Oct 2022	20	29 Oct 2022
Sprint-2	20	6 Days	31 Oct 2022	05 Nov 2022	20	5 Nov 2022
Sprint-3	20	6 Days	07 Nov 2022	12 Nov 2022	20	12 Nov 2022
Sprint-4	20	6 Days	14 Nov 2022	19 Nov 2022	20	19 Nov 2022

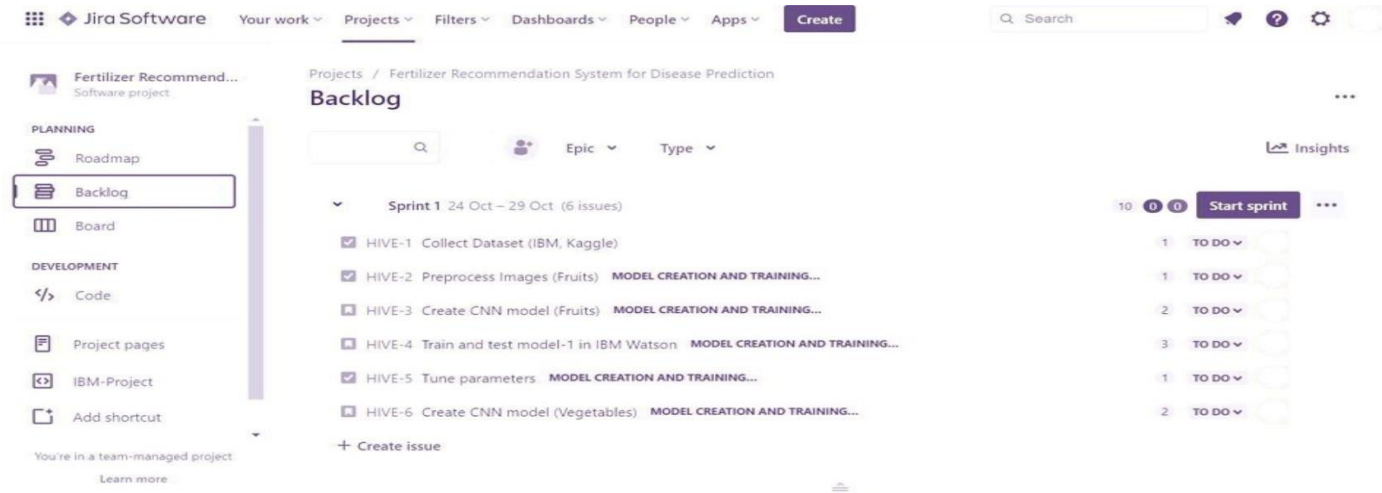
Velocity:
Imagine we have a 10-day sprint duration, and the velocity of the team is 20 (points per sprint). Let’s calculate the team’s average velocity (AV) periteration unit (story points per day) Average Velocity = 20 / 6 = 3.33

Burndown Chart:



Reports from JIRA





CONCLUSION :

The core strategy of this project is to predict the crop based on the soil nutrient contentand the location where the crop is growing. This system will help he farmers to choose the right crop for their land and to give the suitable amount of fertilizer to produce the maximum yield. The Support Vector Machine algorithm helps to predict the crop the precisely based on the pre-processed crop data. This system will also help the new comers to choose the crop which will grow in their area and produce them a good profit.A decent amountof profit will attract more people towardsthe agriculture.

FUTURE SCOPE :

This further research is implementing the proposed algorithm with the existing public datasets. Also, various segmentation algorithms can be implemented to improve accuracy. The proposed algorithm can be modified further to identify the disease that affects the various plantorgans such as vegetables and fruits.

DEMO LINK :

https://youtu.be/4CN70YvpCPE

Github I'd :

https://github.com/IBM-EPBL/IBM-Project-17508-1659672731