Industrial Internship Report on

”IRIS FLOWER CLASSIFICATION”

Prepared by

RISHIRAJ

Executive Summary
This report provides details of the Industrial Internship provided by upskill Campus and The IoT Academy in collaboration with Industrial Partner UniConverge Technologies Pvt Ltd (UCT). This internship was focused on a project/problem statement provided by UCT. We had to finish the project including the report in 6 weeks’ time. My project was IRIS FLOWER CLASSIFICATION This internship gave me a very good opportunity to get exposure to Industrial problems and design/implement solution for that. It was an overall great experience to have this internship.

TABLE OF CONTENTS

• Preface

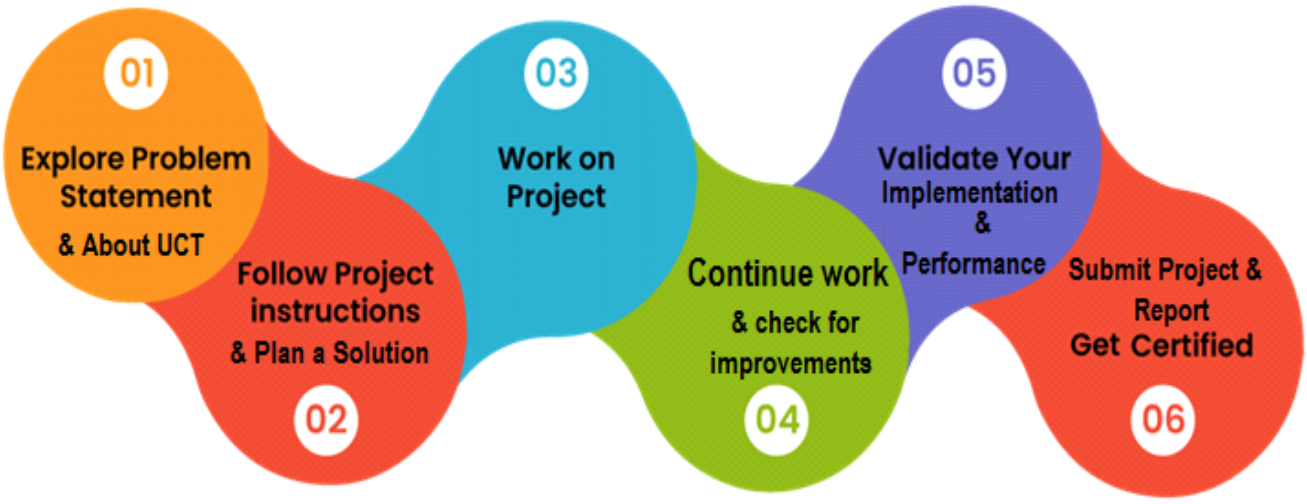
Summary of the whole 6 weeks' work.

About need of relevant Internship in career development.

IRIS FLOWER CLASSIFICATION

Opportunity given by USC/UCT.

How Program was planned



Your Learnings and overall experience.

Thank to all Richa who have helped you directly or indirectly.

For help and support to complete my project .

- # Introduction

- ## About UniConverge Technologies Pvt Ltd

A company established in 2013 and working in Digital Transformation domain and providing Industrial solutions with prime focus on sustainability and RoI.

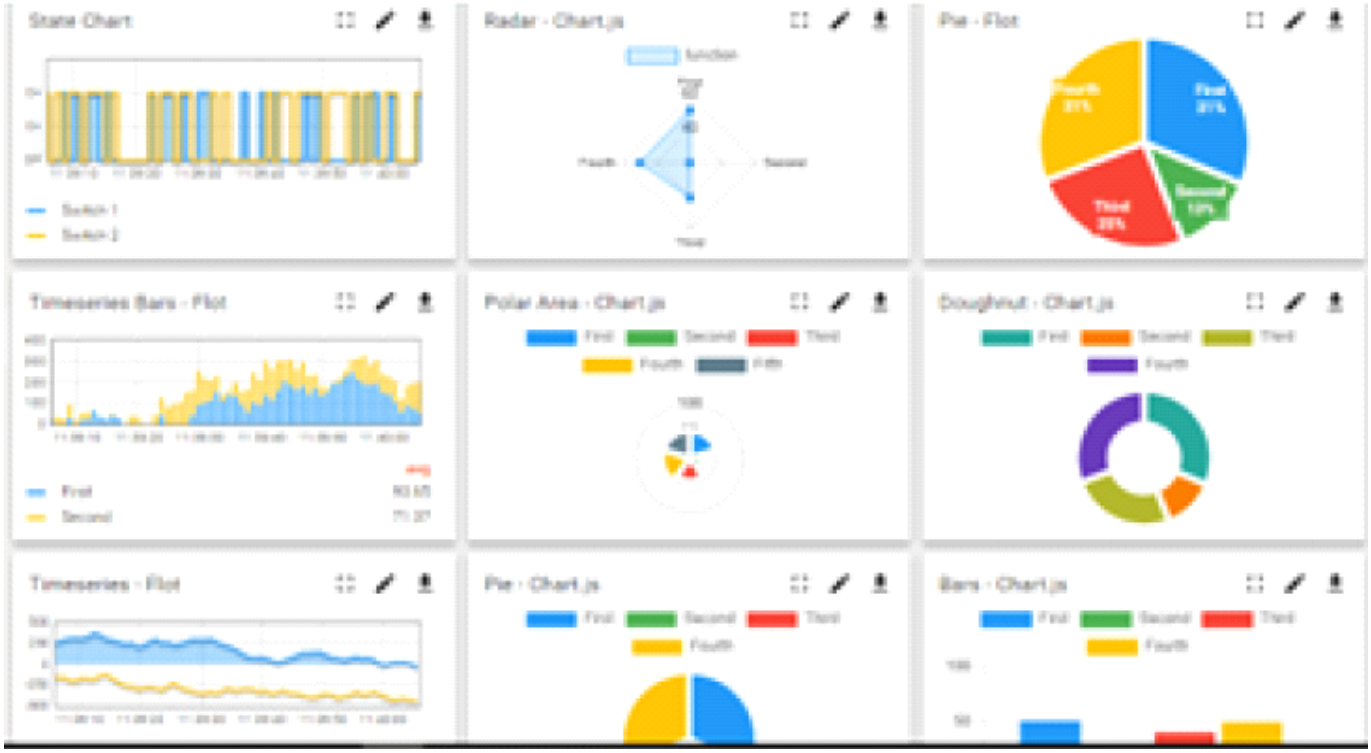
For developing its products and solutions it is leveraging various **Cutting Edge Technologies e.g. Internet of Things (IoT), Cyber Security, Cloud computing (AWS, Azure), Machine Learning, Communication Technologies (4G/5G/LoRaWAN), Java Full Stack, Python, Front end** etc.

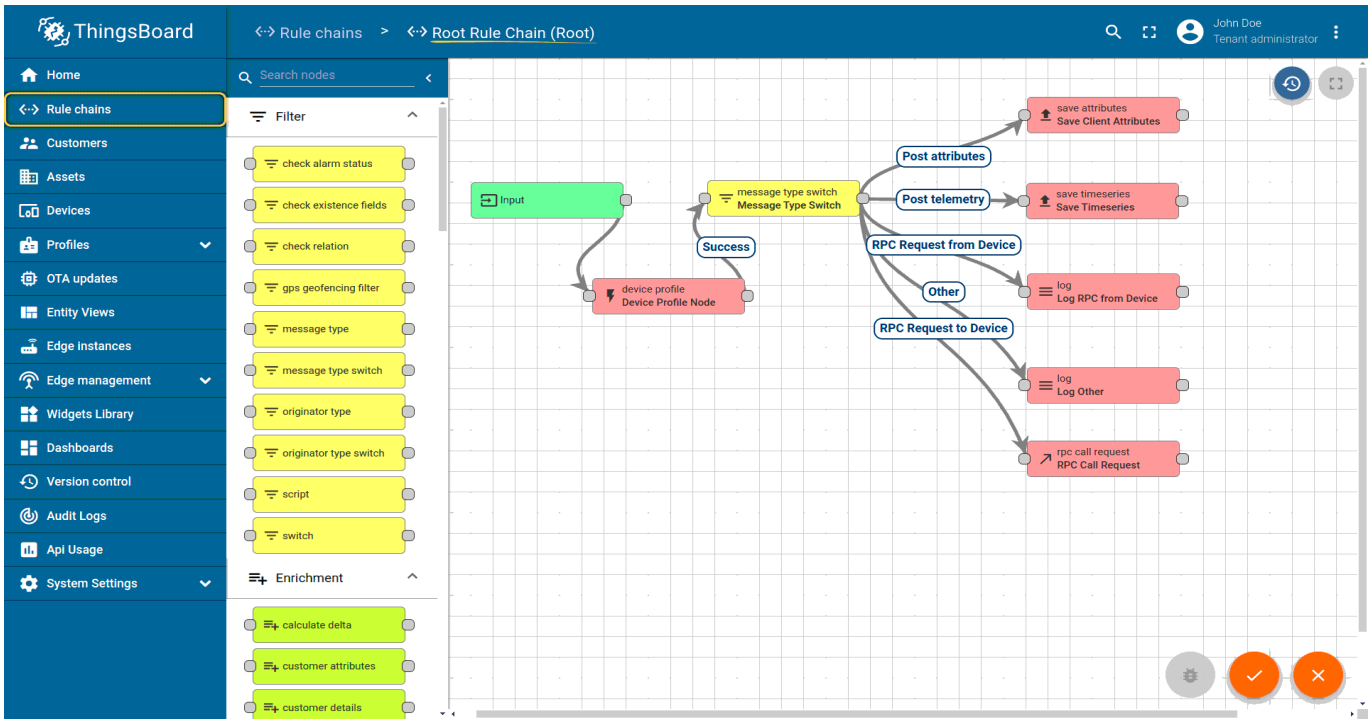
- **UCT IoT Platform (** Insight **)**

UCT Insight is an IOT platform designed for quick deployment of IOT applications on the same time providing valuable "insight" for your process/business. It has been built in Java for backend and ReactJS for Front end. It has support for MySQL and various NoSql Databases.

- It enables device connectivity via industry standard IoT protocols - MQTT, CoAP, HTTP, Modbus TCP, OPC UA
- It supports both cloud and on-premises deployments.

It has features to
• Build Your own dashboard
• Analytics and Reporting
• Alert and Notification
• Integration with third party application(Power BI, SAP, ERP)
• Rule Engine





- **Smart Factory Platform (** FACTORY WATCH **)**

Factory watch is a platform for smart factory needs.

It provides Users/ Factory

- with a scalable solution for their Production and asset monitoring
- OEE and predictive maintenance solution scaling up to digital twin for your assets.
- to unleased the true potential of the data that their machines are generating and helps to identify the KPIs and also improve them.
- A modular architecture that allows users to choose the service that they what to start and then can scale to more complex solutions as per their demands.

Its unique SaaS model helps users to save time, cost and money.

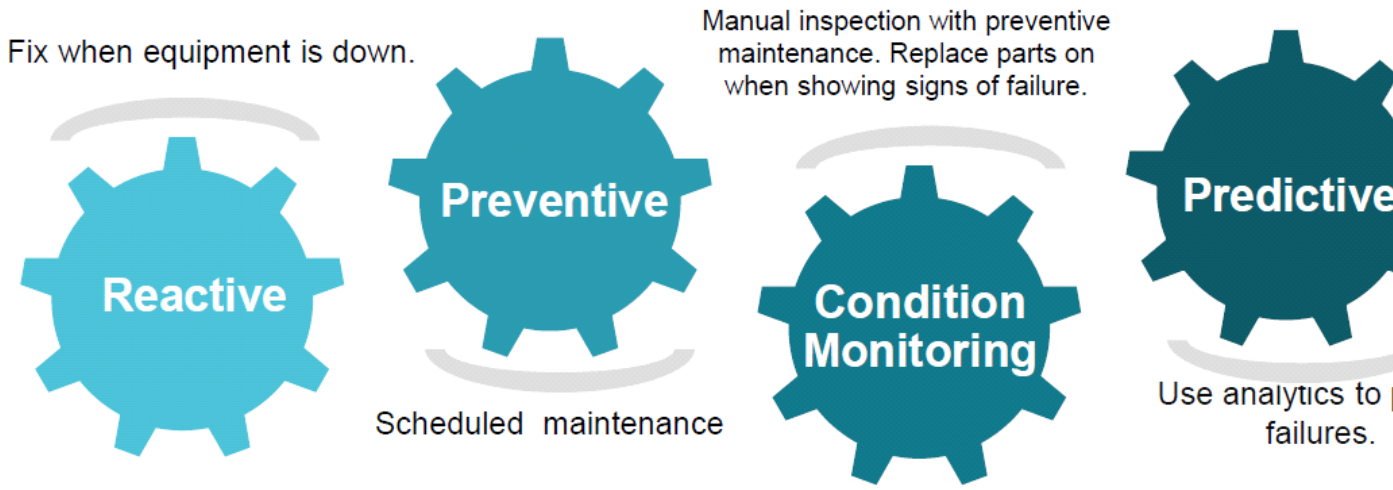
Machine	Operator	Work Order ID	Job ID	Job Performance	Job Progress		Output		Rejection	Time (mins)				Job Status	End Customer
					Start Time	End Time	Planned	Actual		Setup	Pred	Downtime	Idle		
CNC_S7_81	Operator 1	WO0405200001	4168	58%	10:30 AM		55	41	0	80	215	0	45	In Progress	i
CNC_S7_81	Operator 1	WO0405200001	4168	58%	10:30 AM		55	41	0	80	215	0	45	In Progress	i

- LoRaWAN™ based Solution

UCT is one of the early adopters of LoRAWAN teschnology and providing solution in Agritech, Smart cities, Industrial Monitoring, Smart Street Light, Smart Water/ Gas/ Electricity metering solutions etc.

- Predictive Maintenance

UCT is providing Industrial Machine health monitoring and Predictive maintenance solution leveraging Embedded system, Industrial IoT and Machine Learning Technologies by finding Remaining useful life time of various Machines used in production process.

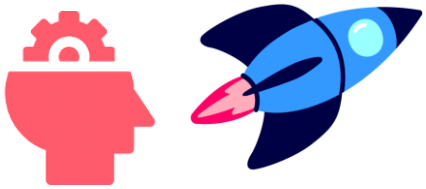


- **About upskill Campus (USC)**

upskill Campus along with The IoT Academy and in association with Uniconverge technologies has facilitated the smooth execution of the complete internship process.

USC is a career development platform that delivers **personalized executive coaching** in a more affordable, scalable and measurable way.

Seeing need of upskilling in self paced manner along-with additional support services e.g. Internship, projects, interaction with Industry experts, Career growth Services



https://www.upskillcampus.com/

upSkill Campus aiming to upskill 1 million learners in next 5 year

- ## The IoT Academy

The IoT academy is EdTech Division of UCT that is running long executive certification programs in collaboration with EICT Academy, IITK, IITR and IITG in multiple domains.

-

- ## Objectives of this Internship program

The objective for this internship program was to

☛ get practical experience of working in the industry.

☛ to solve real world problems.

☛ to have improved job prospects.

☛ to have Improved understanding of our field and its applications.

☛ to have Personal growth like better communication and problem solving.

- **Reference**

[1] https://www.analyticsvidhya.com/blog/2022/06/iris-flowers-classification-using-machine-learning/

[2] https://www.kaggle.com/datasets/arshid/iris-flower-dataset

[3] https://data-flair.training/blogs/iris-flower-classification/

- **Glossary**

Terms	Acronym
Versicolor	
Setosa	
Virginica	
seaborn	

- **Problem Statement**

In the assigned problem statement

Iris flower classification is a very popular machine learning project. The iris dataset contains three classes of flowers, **Versicolor, Setosa, Virginica,** and each class contains 4 features, 'Sepal length', 'Sepal width', 'Petal length', 'Petal width'. The aim of the iris flower classification is to predict flowers based on their specific features.

- **Existing and Proposed solution**

Provide summary of existing solutions provided by others, what are their limitations?

What is your proposed solution?

Machine learning is about learning to predict something or extracting knowledge from data. ML is a part of artificial intelligence. ML algorithms build a model based on sample data or known as training data and based upon the training data the algorithm can predict something on new data.

What value addition are you planning?

- **Supervised machine learning:** Supervised machine learning are types of machine learning that are trained on well-labeled training data. Labeled data means the training data is already tagged with the correct output.
- **Unsupervised machine learning:** Unlike supervised learning, unsupervised learning doesn't have any tagged data. It learned patterns from untagged data. Basically, it creates a group of objects based on the input data/features.
- **Semi-supervised machine learning:** Semi-supervised learning falls between supervised and unsupervised learning. It has a small amount of tagged data and a large amount of untagged data.

- **Code submission (Github link)**

https://github.com/wabrishi/oibsip_taskno.1

- **Report submission (Github link) :** first make placeholder, copy the link.

https://github.com/wabrishi/oibsip_taskno.1/blob/main/InternshipReport.pdf

- **Proposed Design/ Model**

- Applications of Machine Learning:
- **1. Speech Recognition:** Speech recognition uses NLP (Natural Language Processing) to process human speech into written format and vice versa. Some examples are – Google Assistant, Alexa, Siri.
- **2. Recommendation Engine:** Using the past behavior of a human's search data the recommendation engine can produce new data to cross-sell products to customers. For example – Amazon product recommendations, Spotify music recommendations.

- **3. Chatbot:** Chatbots are used to give customer services without any human agent. It takes questions from users and based on the question it gives an answer as a response.
- In this project, we'll solve the problem using a supervised learning approach. We'll use an algorithm called "Support vector machine".
- **Support vector machine:** A support vector machine (also known as a support vector network) is a supervised machine learning algorithm that analyzes data for classification and regression. SVMs are one of the most robust classifications methods.

- **High Level Diagram (if applicable)**

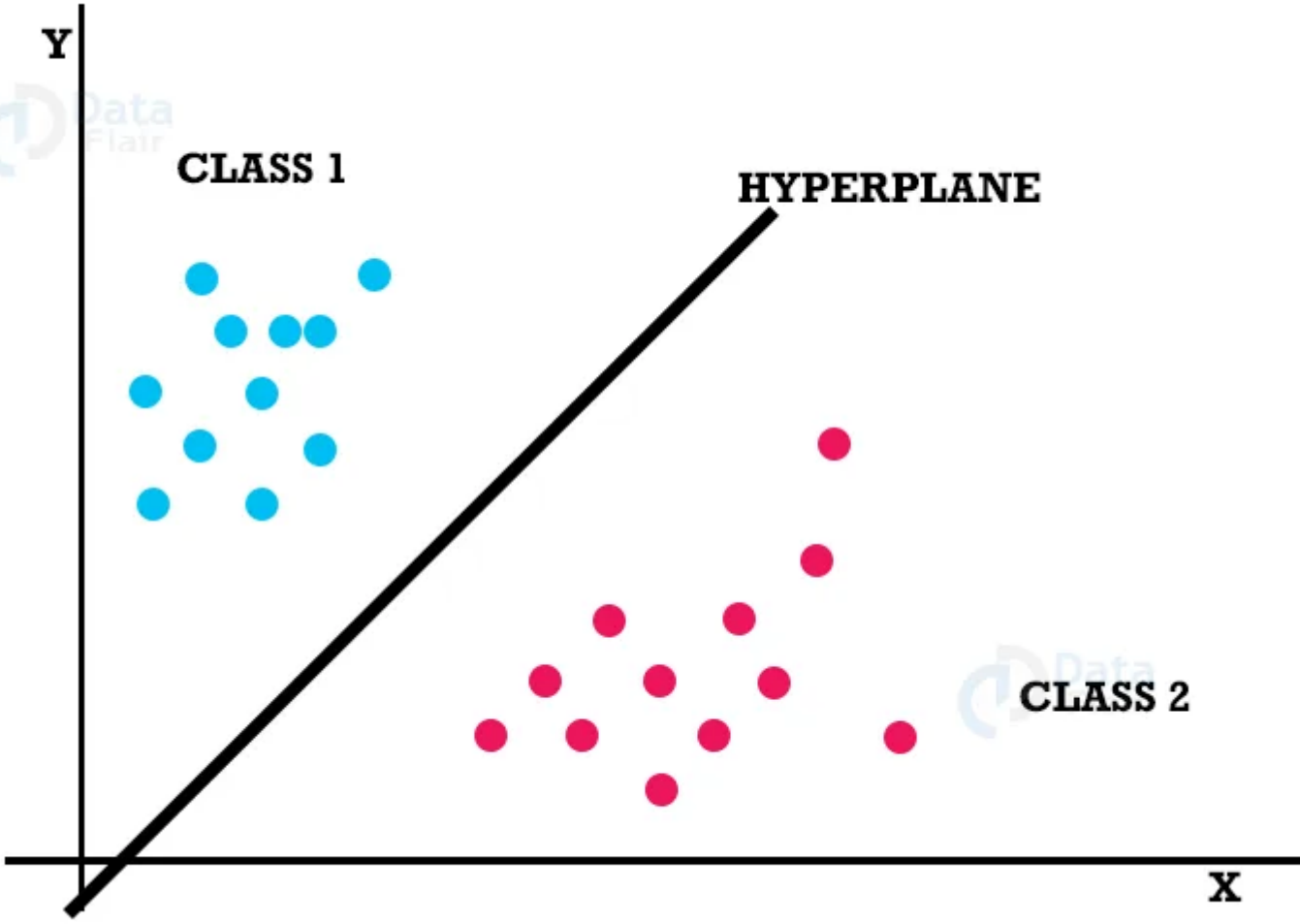
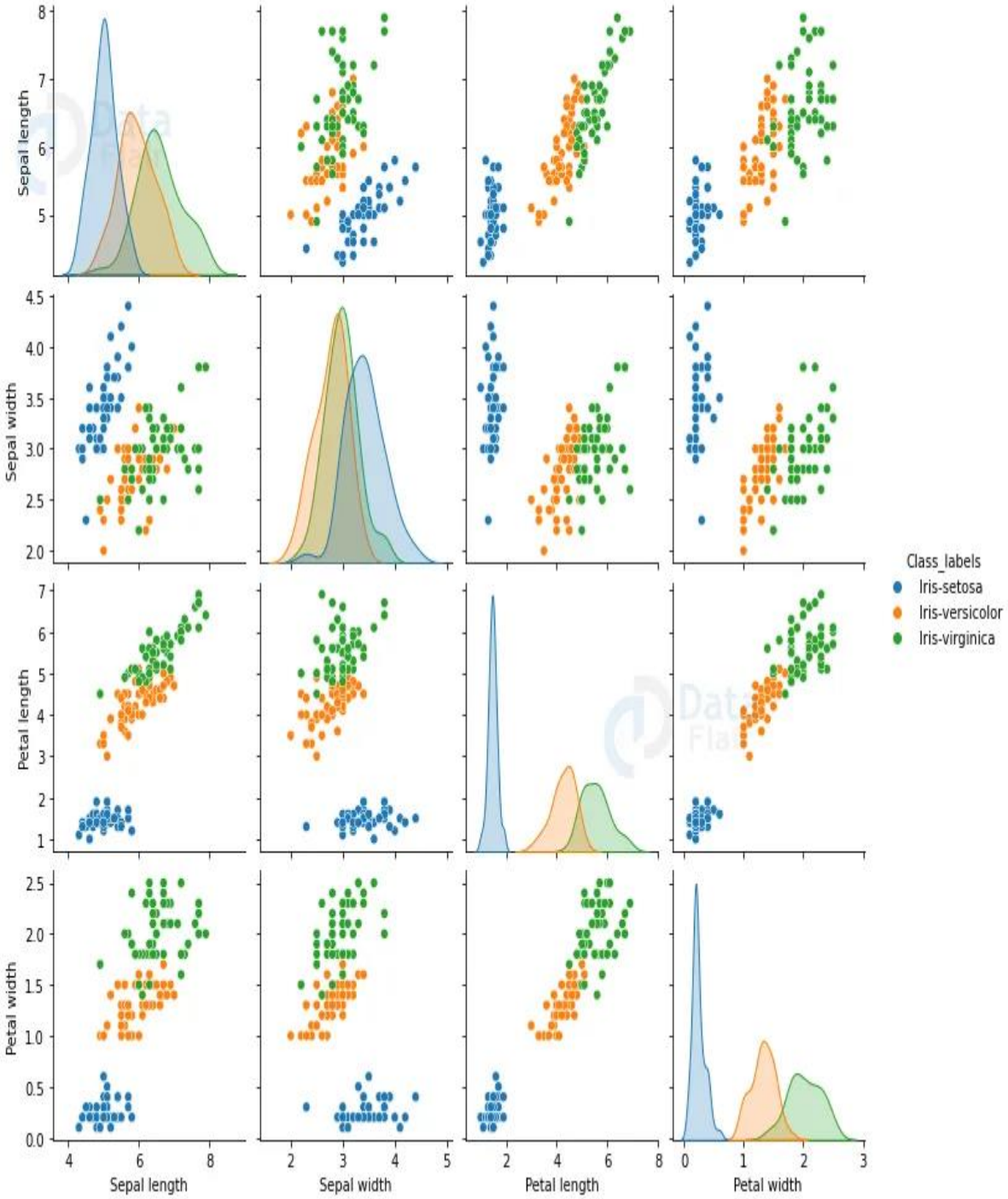


Figure 1: HIGH LEVEL DIAGRAM OF THE SYSTEM

- **Low Level Diagram (if applicable)**

```
In [9]: # Visualize the whole dataset
        sns.pairplot(df, hue='Class_labels')
```

```
Out[9]: <seaborn.axisgrid.PairGrid at 0x7f4350a23a90>
```



- **Performance Test**

This is very important part and defines why this work is meant of Real industries, instead of being just academic project.

Here we need to first find the constraints.

How those constraints were taken care in your design?

What were test results around those constraints?

Constraints can be e.g. memory, MIPS (speed, operations per second), accuracy, durability, power consumption etc.

In case you could not test them, but still you should mention how identified constraints can impact your design, and what are recommendations to handle them.

- **Test Plan/ Test Cases**

  Using train_test_split we split the whole data into training and testing datasets. Later we'll use the testing dataset to check the accuracy of the model.

- **Test Procedure**

Here we imported a support vector classifier from the scikit-learn support vector machine.
Then, we created an object and named it svn.
After that, we feed the training dataset into the algorithm by using the svn.fit() method

- **Performance Outcome**

  - 0.9666666666666667
  - The accuracy is above 96%.
  - Now let's see the detailed classification report based on the test dataset.

- **My learnings**

1. Numpy- 1.19.3
2. Matplotlib- 3.3.2
3. Seaborn – 0.11.1
4. Pandas – 1.2.4
5. Scikit-learn – 0.24.2