

# Supervised ML (Assignment3)

## Assignment Project

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### Problem Statement

A botanical research centre is studying different species of Iris flowers to automate the plant identification process. Currently, botanists manually identify flower species by measuring sepal and petal dimensions, which is:

- Time-consuming
- Error-prone
- Not scalable

The research centre wants to build a **Machine Learning based classification system** that can automatically predict the **species of an Iris flower** based on its physical measurements.

You are hired as a **ML Engineer** to build classification models using:

- K-Nearest Neighbours (KNN)
- Logistic Regression
- Naive Bayes

Your task is to train all three models, compare their performances, and identify the best algorithm.

### Dataset Description

Feature	Description
SepalLengthCm	Length of sepal (cm)
SepalWidthCm	Width of sepal (cm)
PetalLengthCm	Length of petal (cm)
PetalWidthCm	Width of petal (cm)
Species (Target)	Iris-setosa, Iris-versicolor, Iris-virginica

**Note** - Iris dataset is a small, well-balanced & clean dataset with only 150 samples split across 3 categories (50 each). So the models are going to perform extremely good for this dataset but that should not be a realistic expectation from real-life data that we deal with. Because real-life data is not always balanced, has noise & needs a lot of pre-processing.

To make the predictions a little bit worse - only train with 50% of the data & test on 100%.