CONCEPT : INTRODUCTION TO MACHINE LEARNING

Machine learning (ML) : is a branch of artificial intelligence focused on developing algorithms that allow computers to learn from and make decisions based on data. Instead of relying on explicit programming, ML models identify patterns in data to improve their performance on tasks like predictions or classifications. The key objective is to enable machines to learn from data and make accurate decisions or predictions across various domains.

ML can be broadly classified into three types :

SUPERVISED LEARNING

Supervised learning uses labeled data to train models that predict or classify outputs based on new inputs. The main types are :

- Classification : Assigns inputs to predefined categories (eg. spam detection in emails).
- Regression : Predicts continuous values. (eg. house price prediction).

Common Algorithms :

- Linear Regression
- Decision Trees
- Neural Networks.

Applications:

→ Image Classification
→ Predictive Analytics
→ Sentiment Analysis

UNSUPERVISED LEARNING

Unsupervised learning deals with unlabeled data, aiming to uncover hidden structures or patterns. The main tasks include:

→ Clustering: Grouping similar data points (eg. customer segmentation)
→ Dimensionality Reduction: Simplifying data while preserving important features.

Common Algorithms:

→ K-Means Clustering
→ Principal Component Analysis (PCA)

Applications:

→ Anomaly Detection
→ Market Basket Analysis
→ Data Compression

DEMI SUPERVISED LEARNING

demi supervised learning combines a small amount of labeled data with a large amount of unlabeled data, enhancing model performance when labeling data is costly or limited. It leverages the labeled data to guide the learning process on the unlabeled data.

Common Algorithms

→ Self - Training
→ Graph - Based Methods.

Applications:

→ Text Classification
→ Image Recognition
→ Medical Image Analysis

STEP-BY-STEP PROCESS OF USING SUPERVISELY TOOL

STEP ①: PREPARE YOUR IMAGES

→ Collect Images: Gather the 4 images you want to label. Ensure they are in a supported format like JPEG or PNG.

STEP ②: SET UP SUPERVISELY

→ SIGN IN / CREATE ACCOUNT: Go to Supervisely website and sign in. Create one, if you don't have one.

→ Create a New Project:

→ Navigate to the Projects section

→ Create Project.

→ Name your project and select the type.

STEP (3): UPLOAD IMAGES.

→ Create a New Dataset:

→ Within your project, create new dataset.

→ Name the dataset and upload your images.

STEP (4): LABELING OBJECTS IN IMAGES

→ Open Image for Labeling:

→ Click on a dataset and open one of the images.

→ Use the tools on the left to select the type of object you want to label (eg. Polygon, Rectangle, Brush).

→ Label Objects:

→ Draw around the object using the selected tool.

→ Name the object (eg. Car, Tree, Person) and assign it a class.

→ Repeat this process.

→ Save your work.

→ Repeat:

Perform the labeling process for all 1 images.

STEP (5) : EXPORTING THE LABELS

→ Once all images are labeled, export the annotations as JSON files.

→ Go to Project > Export and choose the JSON format.

→ Download the files to your computer.