

Model → generic program, made specific by data used to train it.

Model Training algo → analyze with end point & to determine what changes to be made & iterate.

Model Inference → when trained model is used to make predictions

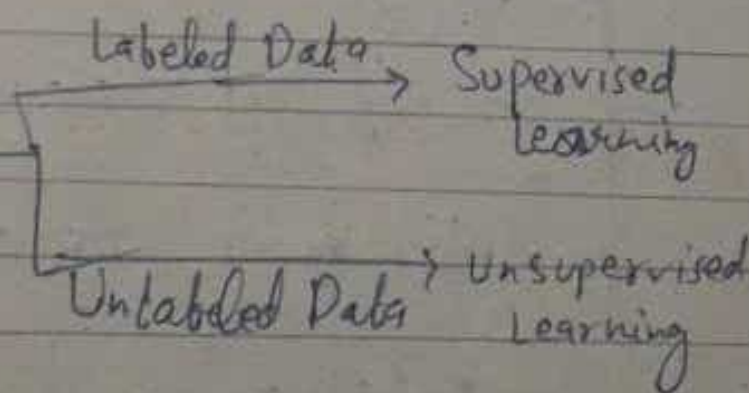
Major steps in ML Process →

Define problem → Build dataset → Train the model → Evaluate the model → Use the model

→ Define the problem :-

\* Be specific

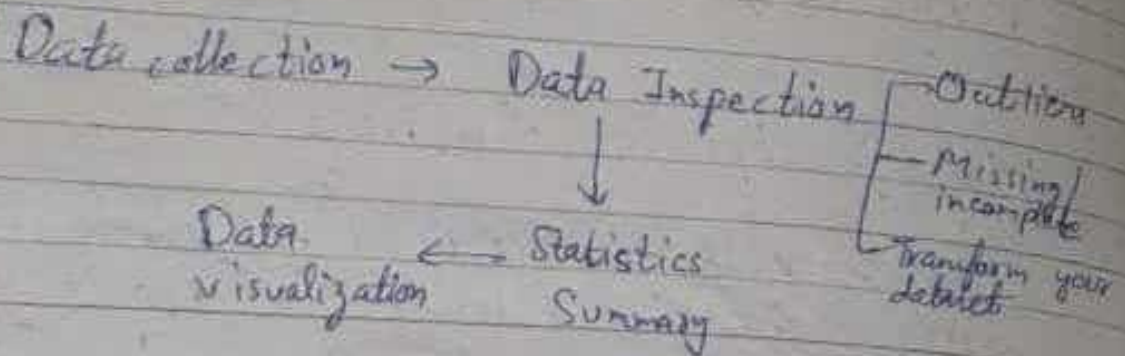
\* ML Task



Supervised Learning :-

Categorical Label  
[Classification]  
Continuous Label  
[Regression]  
and more

Step 2 → Build dataset



Step 3 Model Training :-

Splitting Dataset :- Before you begin training you need to split your dataset.

- Majority will be held in training dataset
- The test dataset will be used during model evaluation.

The end-to-end training process is:

- \* Feed the training data into model.
- \* Compute the loss function on the results.
- \* Update model parameters in a direction that reduces loss.

Step 4 Model evaluation ~

Step 5 ~ Using model ~ Inference [monitoring results]



## Lesson - 3

**Neural networks:**

- Input layer:** This receives
- Hidden Layer:** This layer finds important features
- output layer:** This generates prediction of your model.

## Computer Vision Tasks:

- Image classification
- Object detection → Where in image?
- Semantic segmentation
- Activity recognition.

Image classification use cases:- What

Sorting, Text Detection (OCR),  
Content Filtering

Segmentation → Which pixels in an image represent our object of interest.

Activity recognition → video, detect things that occur over time.

# Reinforcement Learning :-

**Agent** → piece of software you are training is called agent

→ It makes decision in an environment to reach a goal.

**Environment** → surrounding area to which agent interacts

**State** → current position within environment that is visible, known, to an agent.

**Feedback** → is a numerical reward.

**Episode** → a period of trial & error when agent makes decisions & gets feedback from its environment.

- 1) Soft Actor Critic (SAC) - Data efficient  
Continuous Action Space. lack stability
- 2) Proximal Policy Optimization (PPO) -  
works in both Continuous & data hungry  
Discrete Stable

**Action Space** - Set of all valid actions available to agent as it interacts with environment

Discriminative technique  $\rightarrow$  Classify  
Generative technique  $\rightarrow$  Generate  
[Creating a new data  
from training data]

Generative adversarial networks (GAN)  
 $\rightarrow$  create new neuron networks.

Autoregressive models (AR-CNN) :- dependent

Transformer based models  $\rightarrow$  data with sequential structure.

Generator  $\rightarrow$  creates music

Discriminator  $\rightarrow$  judges & coach