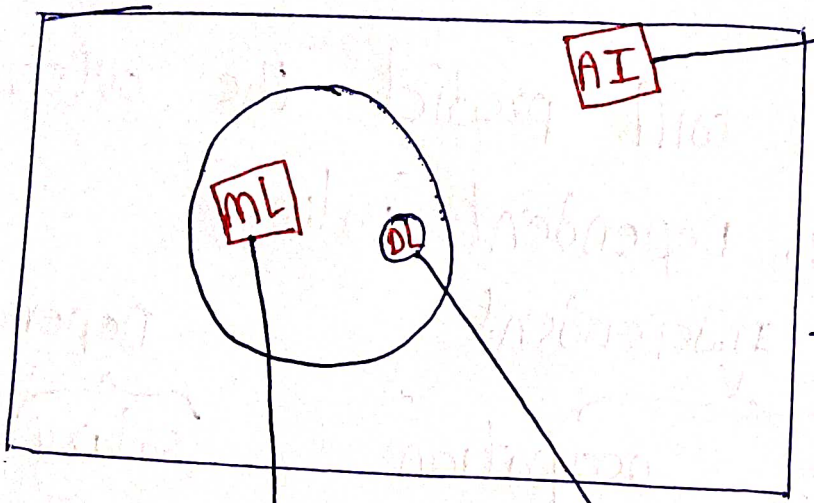
Introduction to Machine Learning

AI vs ML vs DL vs DS :



→ Artificial Intelligence is the science where the Machine can take It's own Decission without any Human Interventions.

* Machine Learning is used to make Models which can be used to predict outcomes.

* Deep Learning will give the human mimic to ML Models.

* The combination of AI, ML and DL is called Data science.

Types of Machine Learning:

* Supervised:

* Independent and Dependent values were present.
* ML model will predict the outcome values. i.e, Dependent value.

eg:

Experience (Independent)	occupation (Independent)	Salary (Dependent)
1	Teacher	15000
2	software	40000
3	Teacher	16000
4	plumber	20000
5	plumber	2000

* ML model will take Independent values and predict salary.

* unsupervised:

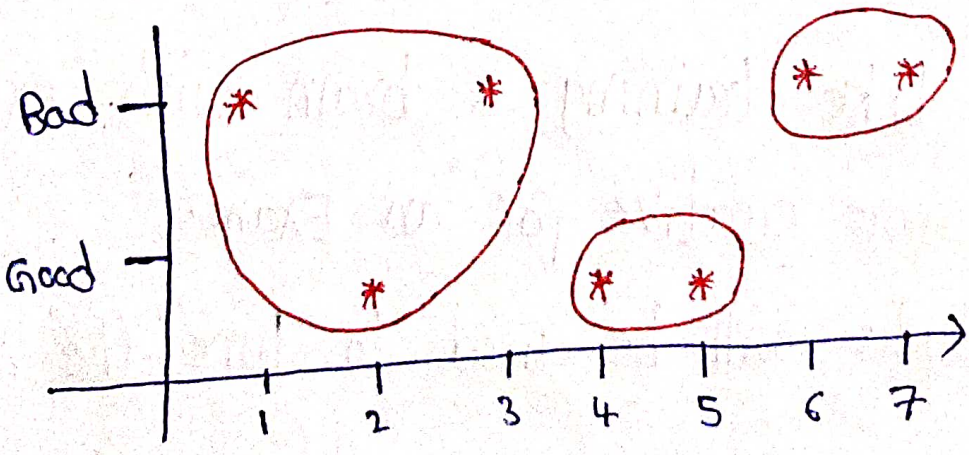
* Independent values were present

* we will form clusters and divide given data into groups.

eg:

Time spent in hrs.	Review
1	Bad
2	good
3	Bad
4	good
5	good
6	Bad
7	Bad

clusters:



Reinforcement Learning:

* In this process, the model will learn from it's mistakes and improve it's performance.

eg: * Humans were best Example, As a child they will learn things from mistakes and improve themselves.

Data splitting:

* Train:

→ It's Like training a brain to be ready for an Exam.

→ The data will be used to train the model.

* Validate:

→ It's Like training a brain with Extra books to be more creative for an Exam.

→ This data will be used to tune the model.

*Test:

→ It's like sitting in Exam hall to write Exam.

→ This data is used to test our training and validate data and check how well model is trained.

overfitting:

* Train Data accuracy - 95%.
  Test Data accuracy - 65%.

} This is ~~underf~~ overfitting, as Train Data accuracy is more than Test Data accuracy.

Here Train accuracy is More, so we have Low Bias.

Test accuracy is Less, so we have High ~~Bias~~ Variance

* Generally Train accuracy is inversely proportional to Bias
Test accuracy is inversely proportional to Variance.

Underfitting:

* Both Train and Test accuracy are low

Train → 55% ⇒ High Bias.

Test → 50% ⇒ High Variance.

Generalised Model:

* Here, Both Train and Test accuracy will be High.

Train → 86% ⇒ Low Bias

Test → 87% ⇒ Low Variance.