26/9/25

Assignment -2.

Q1. Define machine learning.

→ A ~~fie~~ It is field of computer Science, that study algorithm & technique for automatic solution to complex problem.

Q2. Write application of machine learning.

→ 1) Speech recognisation
2) Image recognisation
3) Banking
4) Stock market
5) Medical sector
6) Online fraud detection
7) Traffic conjestion analysis & prediction.

Q3. Explain in detail type of machine learning.

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1) Supervised learning :- A model gets trained on labelled dataset. The sets have input & output parameters.
The algorithm learn to map points between inputs & correct outputs.
Categories :- a) Classification
b) Regression.

2) Unsupervised learning :- The algorithm discovers patterns & relationships using unabeled data.
It ~~dono~~ doesn't provide algorithm with labeled target o/p.

The primary goal is to discover hidden patterns, similarities or clusters within data, which can be used for data exploration, visualization, etc.
Categories: a) Clustering
b) Association.

3) Reinforcement learning :- It happen interaction with environment by producing actions & discovering errors.
Trial, error & delay are most relevant characteristics of reinforcement learning.
eg.
Google self Driving car, AlphaGo, etc.

Q4. Explain algorithm for supervised & unsupervised machine learning.

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a) Supervised ML :- It involves training a model on labeled dataset.
Algorithm process :-
i) Data collection & Labeling :- A dataset is gathered where each data point includes input features & corresponding output label.
ii) Model Training :- The algorithm analyzes labeled data to identify patterns & relationships between input features & o/p labels.

iii) Prediction :- Once trained, the model can be used to predict o/p label for new, unlabeled input data.
eg. Classification, regression.

b) Unsupervised ML :-
It deals with unlabeled datasets.
Algorithm process :-
i) Data collection :- A data set is gathered containing only input features not output labels.

ii) Pattern Discovery :- The algorithm explores the data to find hidden structures, groupings or commonalities among the data points.

iii) Interpretation :- To discovered patterns to be interpreted by a human to assign meaning or derive insights.

eg. Clustering, Association, Dimensionality reduction

Qs. Explain Linear Regression in detail. List it's type.

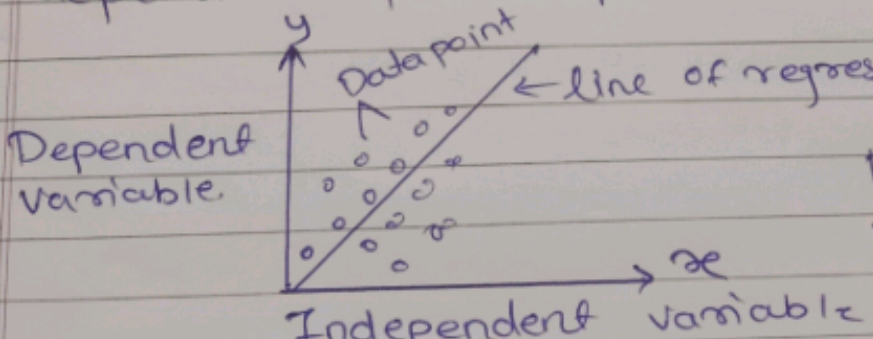
→ L.R is type of supervised machine learning algorithm that learns from labelled datasets & maps the data point with most optimized linear functions which can be used for prediction on new datasets.

It assumes that there is linear relationship between input & output, meaning o/p changes at constant rate as input changes.

This relationship is represented by straight line.

It helps to understand relationship between various data point & help to find hidden data points among a data.

It help to discover best relationship betwn dependent & independent variable.



$Y = ax + b$

x → Independent variable

Y → Dependent variable

a, b → linear coefficient.

Types :- 1) Positive LR

2) Negative LR.