1. What is Pattern Recognition

Ans:

Pattern recognition is an integral part of most machine systems build for decision making.

or

Pattern recognition is a process of extracting Pattern / knowledge from data / big data.

2. Write the Purpose of Pattern Recognition

Ans:

a. Classification of object into classes
b. Classes may be images, signals, waveforms.
c. Recognition of Pattern
d. Observe environment
e. Learn to distinguish Patterns of interest.

3. What is Data.

Ans:

Any kind of recorded fact. It can be numbers, texts, images.

4. What is Information

Ans:

The Patterns among all the data can Provide information.

5. What is knowledge

Ans:

Information can be converted into knowledge about historical Pattern & future trends.

Model এবং Rules

Test Data

Sunny

Values

Data ⟶ Information ⟶ knowledge

=> Information থেকে আমরা knowledge পাই.

=> knowledge ; data তে থাকে না,

=> knowledge মানে আমরা কোনকিছু Predict করতেছি, এই Prediction টা করছি Probability এর উপর base করে,

6. Define Machine ~~Re~~ Learning.

Ans:

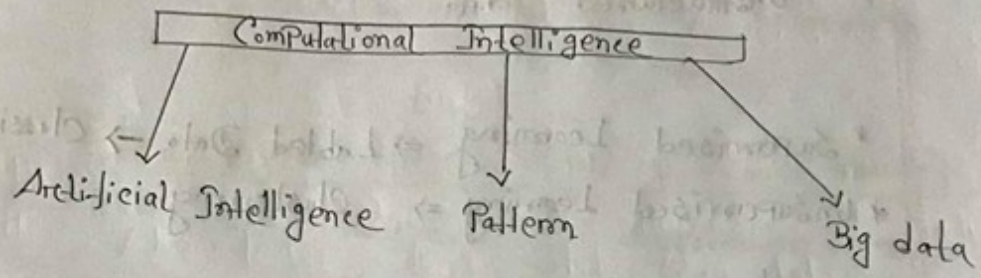
It is a branch of ~~machine learning~~. Artificial Intelligence. Provides the technical basis of Pattern recognition.

7. Write the difference between Machine Learning & Data Mining.

Ans:

Data Mining	Machine Learning
a. Extracting knowledge from a large amount of data.	a. Introduce new algorithm from data as well as Past experience.
b. Data mining is used to get the rules from the existing data.	b. Machine learning teaches the Computer to learn & understand the given rules.
c. Involves human interface more towards manual.	c. Once design self-implemented, no human effort.
d. Applied in limited area	d. Used in a vast area.

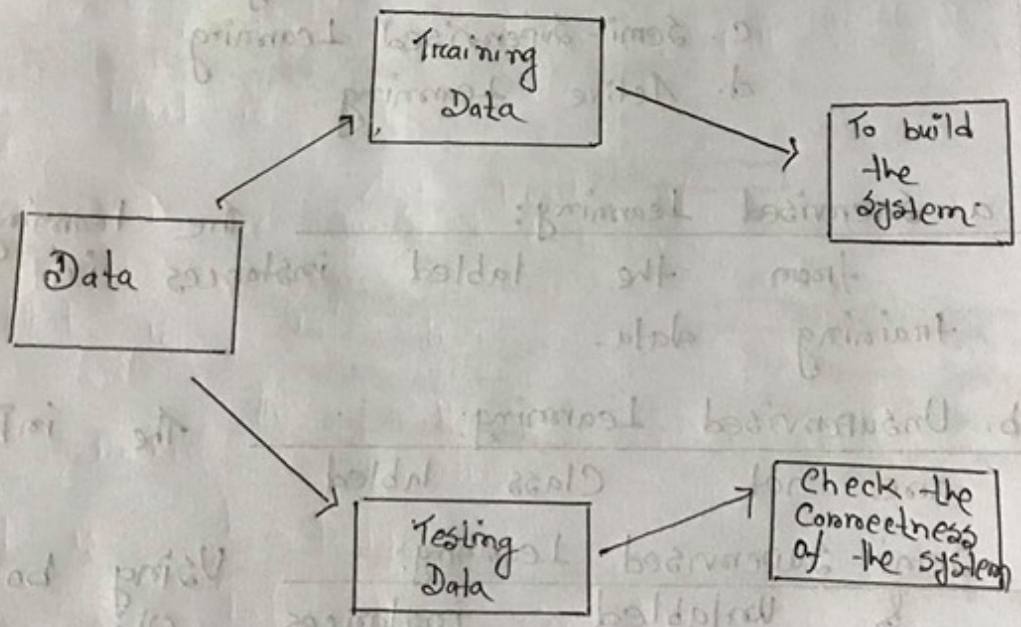
Cluster Analysis এর জন্য ব্যবহার করা হয় Data Mining.



8. What is Computational Intelligence

Ans:

It refers to the ability of a Computer to learn specific task from data or experimental observation.



9. What is Big data

Ans: Massive volume of both structured & unstructured data.

* Supervised learning => Labled Data -> Classification
* Unsupervised learning => Clustering

10. Describe different types of learning.

Ans: There are 4 types of learning

a. Supervised learning
b. Un-supervised learning
c. Semi-supervised learning
d. Active learning.

a. Supervised learning: The learning comes from the labled instances in the training data.

b. Unsupervised learning: The input instances are not Class labled

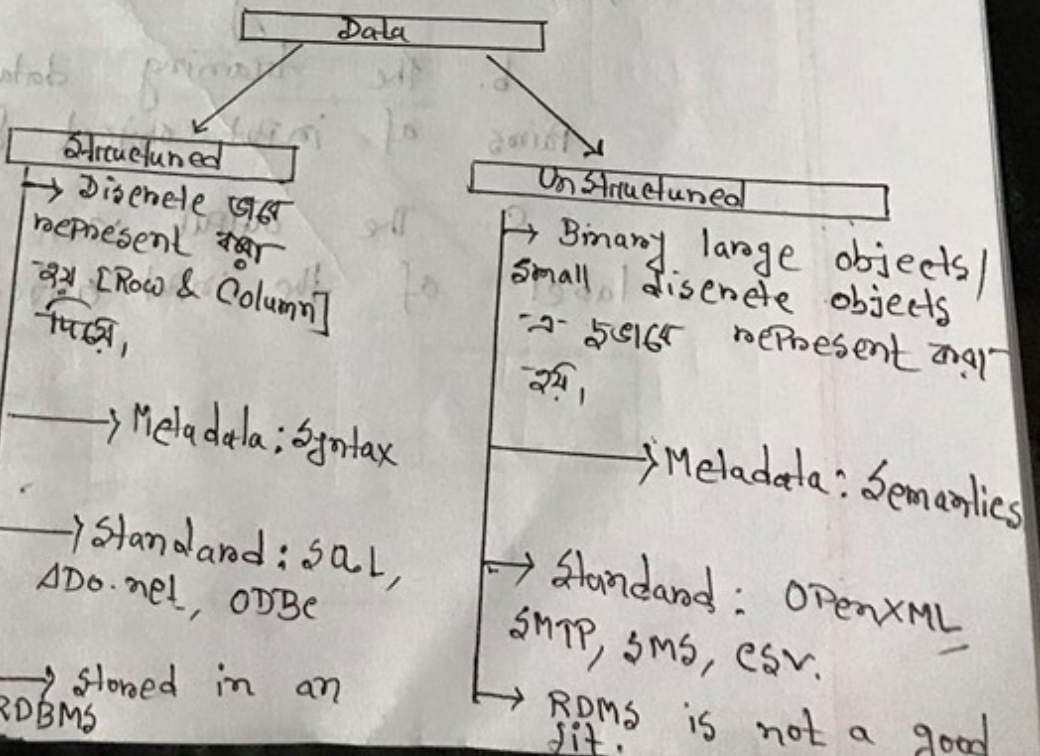
c. Semi supervised learning: Using both labled & Unlabled instances when learning a model.

d. Active learning: This approach can ask a user (domain expert) to label an instance, which may be form a set of unlabelled instances. // Model কে re-train করা হয়।

11. What is KDD [Knowledge Discovery From Database]

Ans. The Process of discovering useful knowledge from a collection of data.

- Data is a raw material
- Table managed => DBMS
- অনেকগুলো database একসাথে connected থাকলে তখন, সেটা বলে যাবে RDMS [~~Rel~~ Relational Database]
- Data দুই ধরনের হয়ে থাকে.



Model বা Rule

Data

Data Mining এর দুটো Major function কী

a. Classification
b. Clustering

12. What is the aim of Classification

Ans: Classification maps data into Predefine groups or classes.

13. Why Classification is neffered as supervised learning

Ans: The classes are determined before examining the data.

14. Write the work flow of Classification

Ans: a. Classification creates a function from training data.

b. The training data consist of pairs of input object & desired output.

c. The output can Predict a class label of the input object.

15. What is the key difference between Classification & Clustering

Ans:

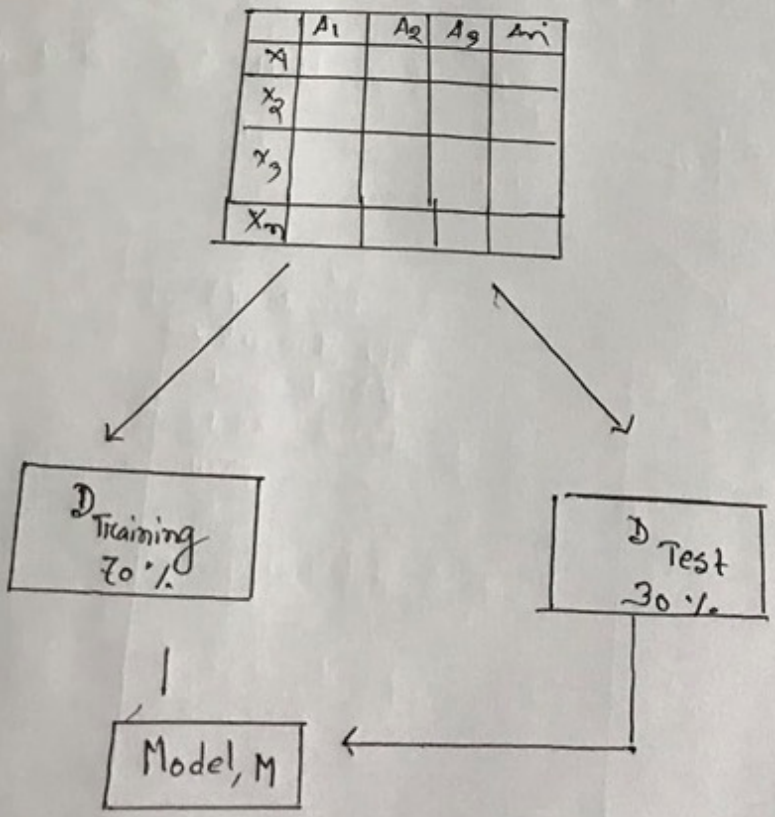
The groups are not Pre-defined, but rather defined by the data alone.

- Clustering use করে unsupervised learning or segmentation করা জন্য,
- Clustering এর মাধ্যমে most similar data গুলো নিয়ে cluster তৈরি করা হয়।

16. What is Algorithm

Ans:

The Process of solving a Problem.



Model → Neural Network.

- M = Machine Learning Model.
- 30% কিছু কে test করছি, যেটা unseen, unknown during training.
- X_i = An instance / vector / Datapoint / Example ~~/ obj~~ / observation / row
- A_i = Attribute / feature
- a_{ij} = Attribute value.
- Dataset থেকে কিছু নিলে যেটা হল information.