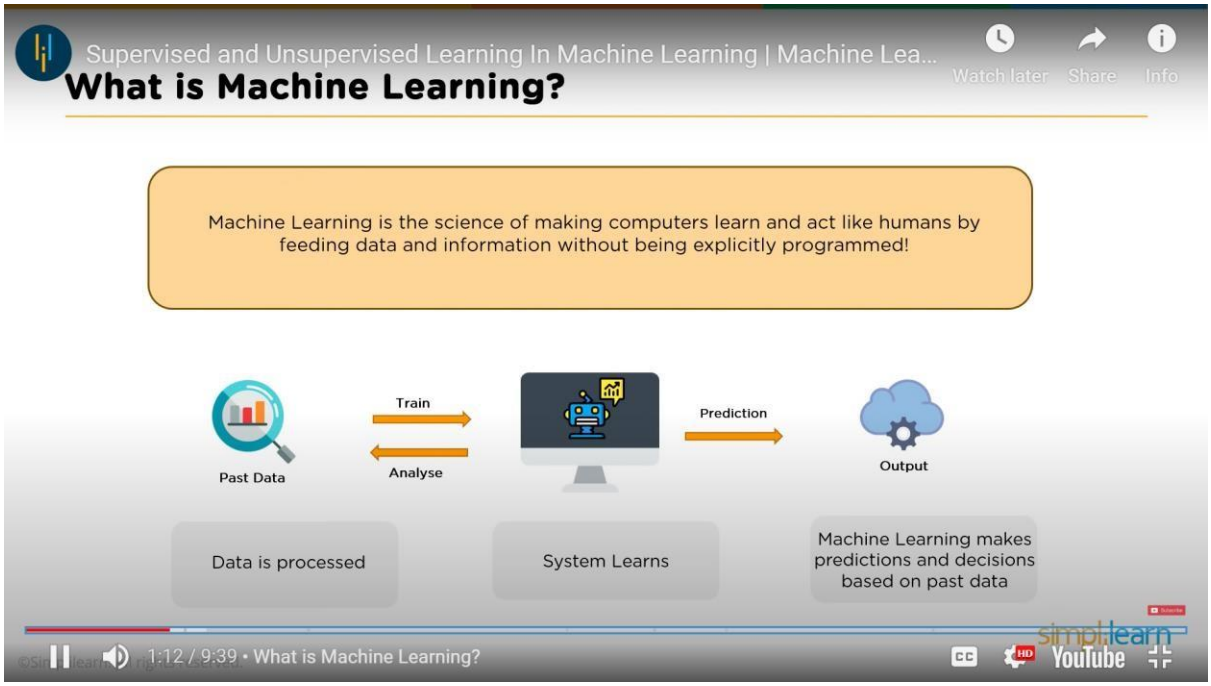
PREPARATION PHASE

PRIOR KNOWLEDGE

DATE	22 AUGUST 2022
TEAM ID	PNT2022TMID02261
PROJECT NAME	EARLY DETECTION OF CHRONIC KIDNEY DISEASE USING MACHINE LEARNING

PRIOR KNOWLEDGE:

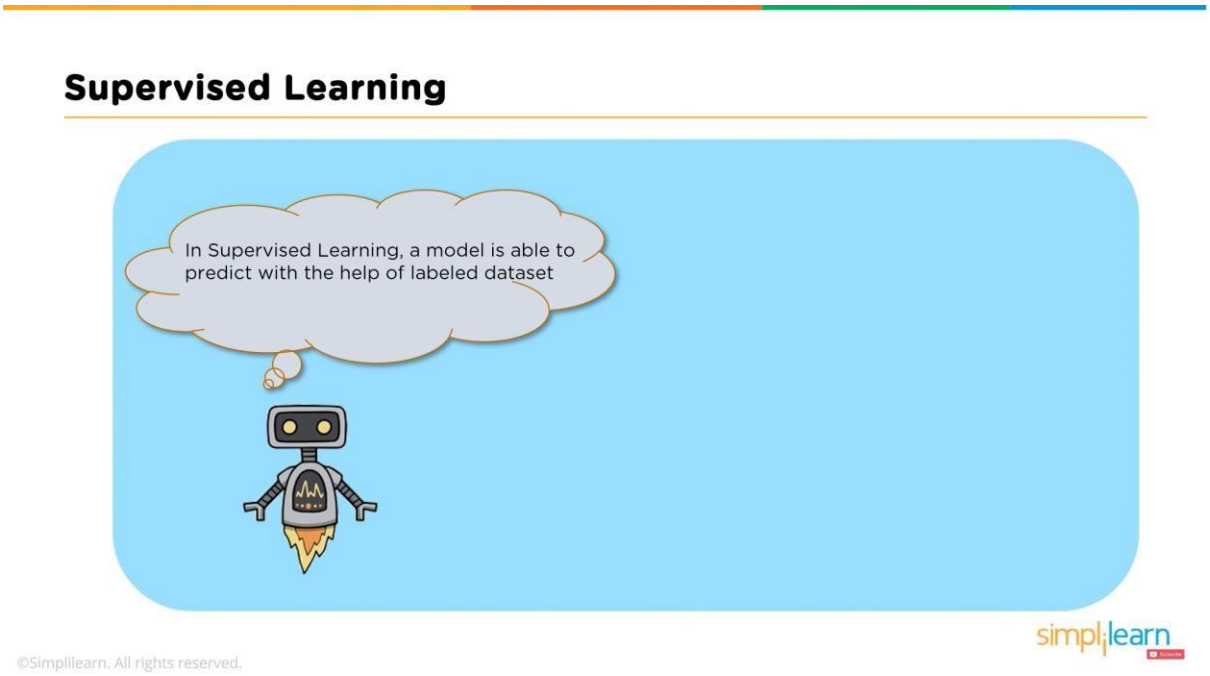
Machinelearning:



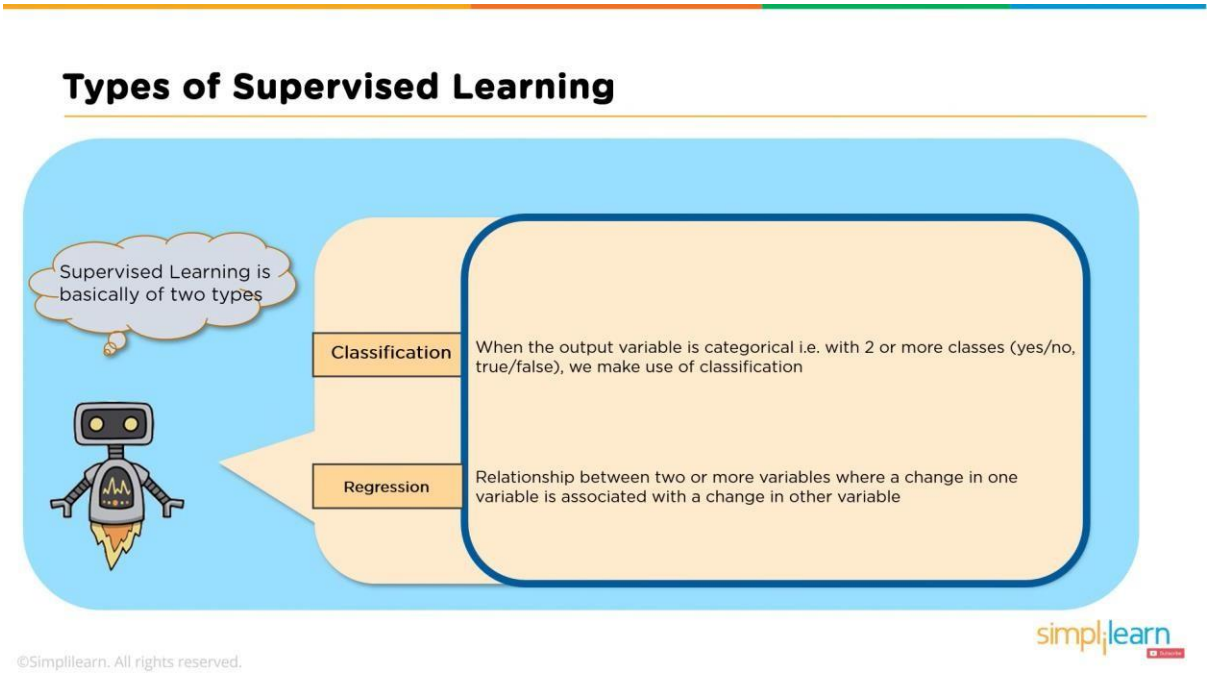
Machinelearningisdefinedasmakingmachineslearnandact ashumansbyfeedingthem withdata.

Therearetwotypesoflearninginmachinelearning:

1. Supervisedlearning:



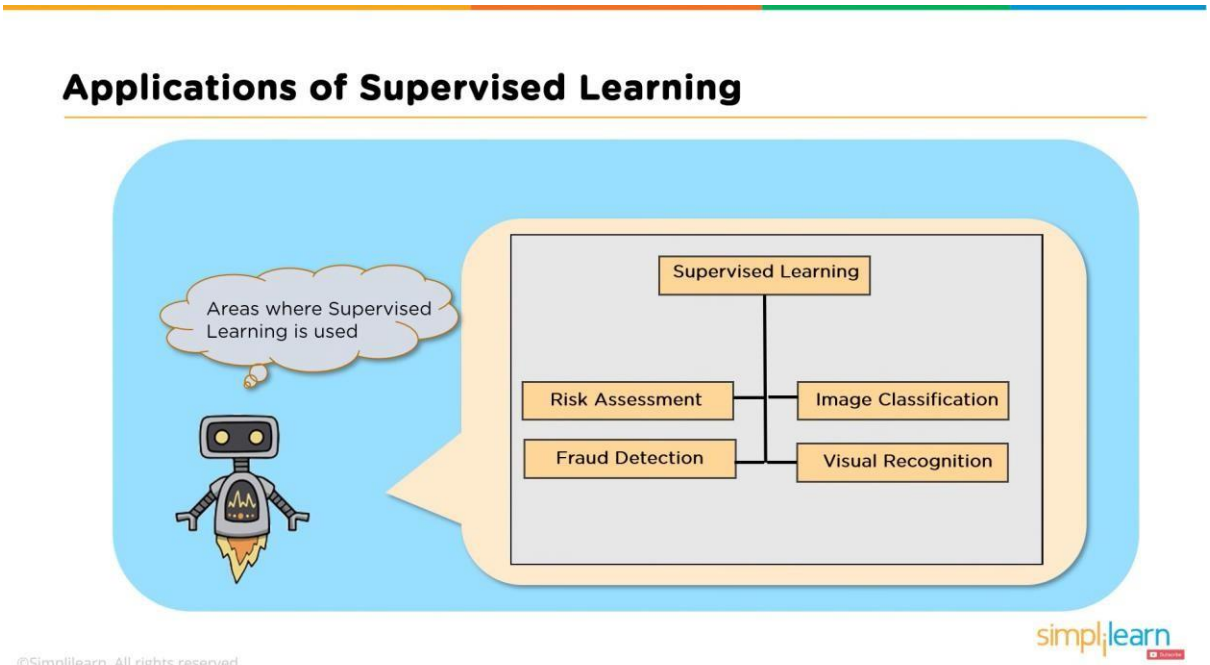
Supervisedlearningisdonewiththe helpofalabelleddataset.



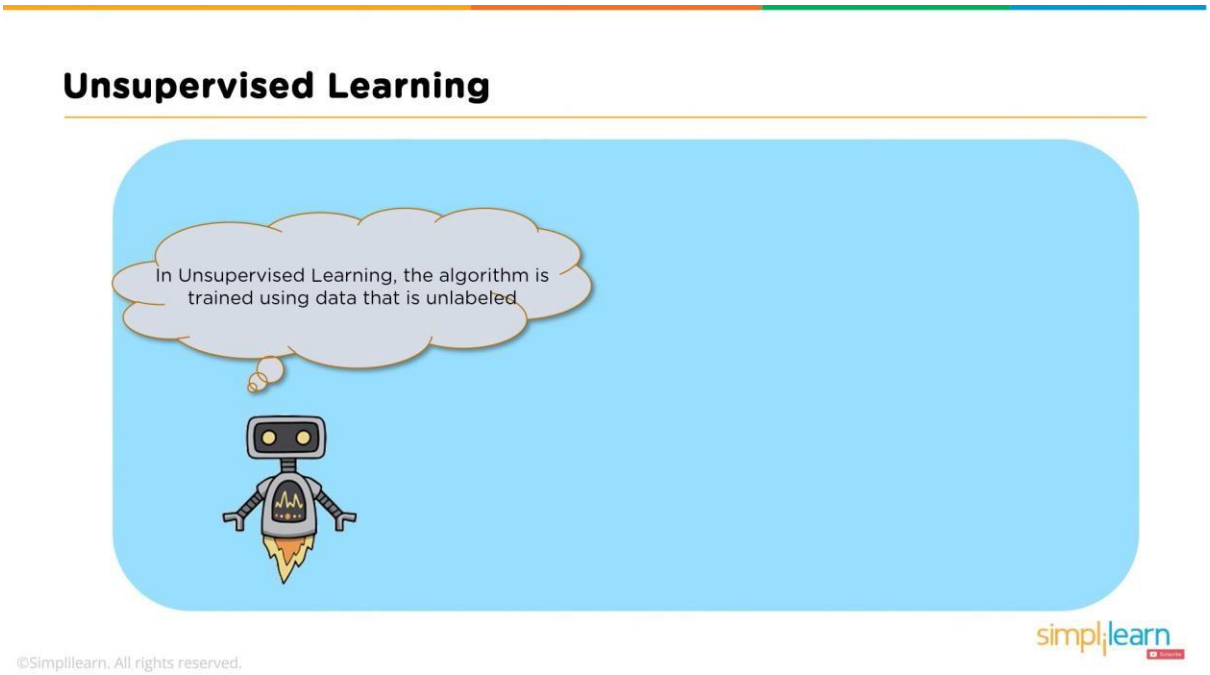
Therearetwotypes ofsupervisedlearning:
a) Classification

b) Regression

Applicationsofsupervisedlearning:



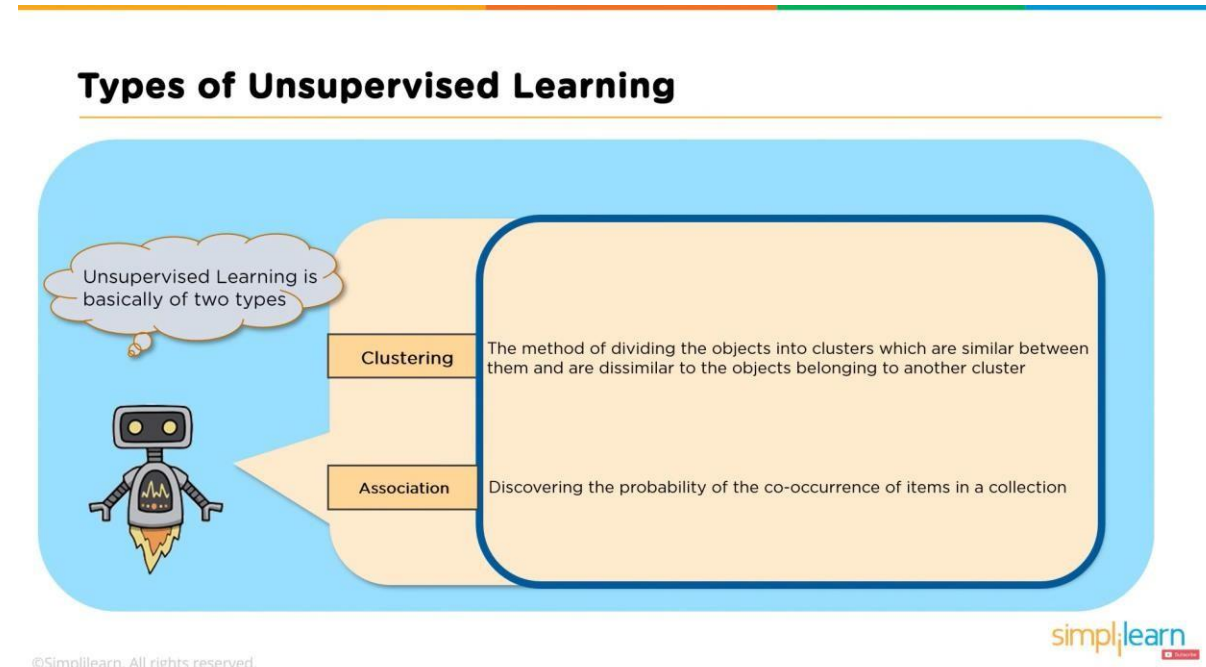
2. Unsupervisedlearning:



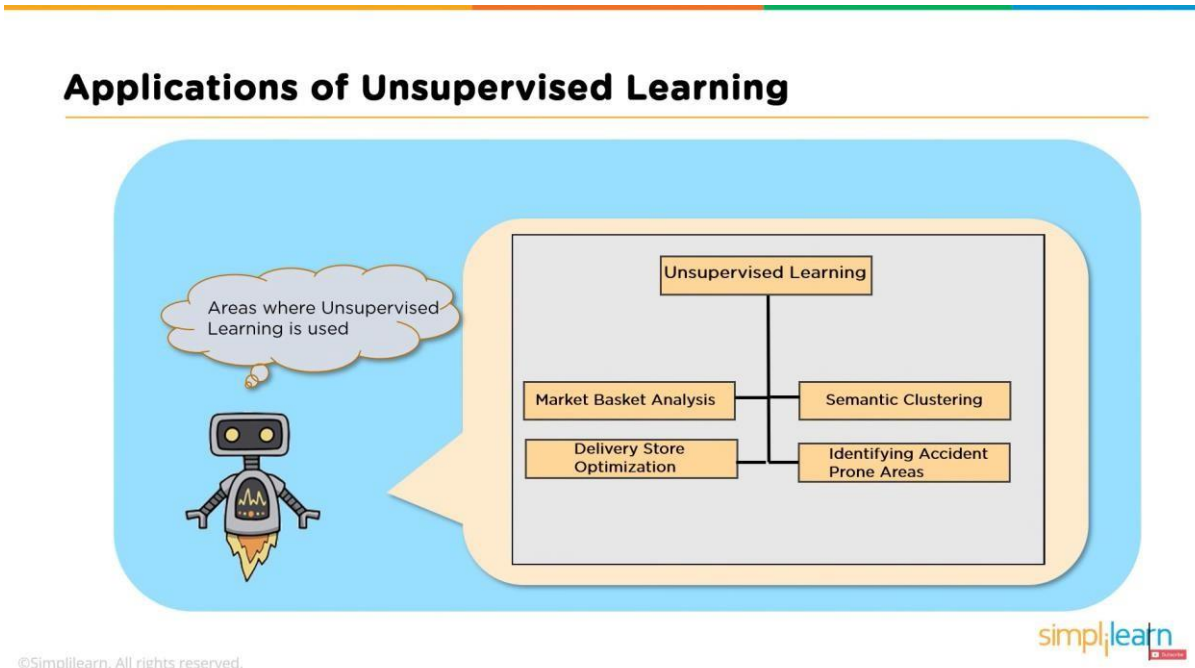
Unsupervised learning is defined as using unlabeled data to train themodel.

Typesof unsupervisedlearning:

a) Clustering
b) Association



Applicationsofunsupervisedlearning:



Classification:

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Classification Problem

Goal: predict category of new observation

Earlier Observations —Estimate→ **CLASSIFIER**

Unseen Data —CLASSIFIER→ **Class**

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Classification Applications

- **Medical Diagnosis**
- **Animal Recognition**

Important:

- Qualitative Output
- Predefined Classes

Regression:

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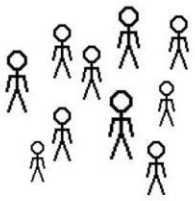
Regression

PREDICTORS → REGRESSION FUNCTION → RESPONSE



- Relationship: **Height** - **Weight**?
- Linear?
- Predict: **Weight** ⟶ **Height**

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Regression Model

Fitting a **linear** function

$$\text{Height} \approx \beta_0 + \beta_1 \times \text{Weight}$$

- **Predictor:** Weight
- **Response:** Height
- **Coefficients:** β_0, β_1

Estimate on previous input-output

```
> lm(response ~ predictor)
```

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Regression Applications

- Payments → Credit Scores
- Time → Subscriptions
- Grades → Landing a Job

- Quantitative Output
- Previous **input-output** observations

Clustering:

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Clustering

- **Clustering:** grouping objects in clusters
  - *Similar* within cluster
  - *Dissimilar* between clusters
- **Example:** Grouping similar animal photos
  - No labels
  - No **right** or **wrong**
  - Plenty possible clusterings