



SNS COLLEGE OF ENGINEERING



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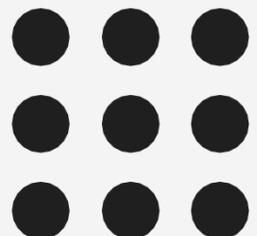
Department of Information Technology

19IT601– Data Science and Analytics

III Year / VI Semester

Unit 3 – PREDICTIVE MODELING AND MACHINE LEARNING

Topic 6: Introduction to ML





Introduction to ML



Machine learning algorithms are classified into 3 types:

- Supervised Learning
- Unsupervised Learning
- Reinforcement Learning

Supervised Learning

Supervised ML algorithms is a type of ML technique that can be applied according to what was previously learned to get new data using labeled data and to predict future events or labels.

In supervised learning, we give it a set of training data, that the model learns from. It can then infer relationships between the features and the categories that we want, and apply that to unseen new values - and predict information about them.

In supervised learning, models are trained using labelled dataset, where the model learns about each type of data. Once the training process is completed, the model is tested on the basis of test data (a subset of the training set), and then it predicts the output..



Introduction to ML



Supervised learning can be further divided into two types:

- Classification
- Regression

Classification

Classification is used when the output variable is categorical i.e. with 2 or more classes. For example, yes or no, male or female, true or false, etc.

Regression

Regression is used when the output variable is a real or continuous value. In this case, there is a relationship between two or more variables.

Types of Supervised Learning Algorithms

- Linear Regression
- Logistic Regression
- Naive Bayes Classifiers
- Decision Trees
- Random Forest
- Support Vector Machine



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Unsupervised Learning

In Unsupervised Learning, the machine uses unlabeled data and learns on itself without any supervision. The machine tries to find a pattern in the unlabeled data and gives a response.

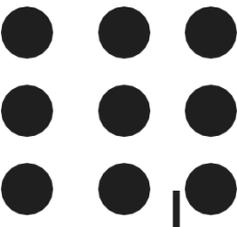
The goal of unsupervised learning is to find the structure and patterns from the input data. Unsupervised learning does not need any supervision. Instead, it finds patterns from the data by its own.

Unsupervised learning can be further grouped into types:

- Clustering
- Association



Introduction to ML



Clustering

Clustering is the method of dividing the objects into clusters that are similar between them and are dissimilar to the objects belonging to another cluster. It is grouping of data's based on similarity.

For example, finding out which customers made similar product purchases.

Association

Association is a rule-based machine learning to discover the probability of the co-occurrence of items in a collection. For example, finding out which products were purchased together.

The most commonly used unsupervised learning algorithms are:

- K-means clustering
- Hierarchical clustering
- Apriori algorithm
- Principal Component Analysis



Introduction to ML



Reinforcement Learning

Reinforcement Learning is a feedback-based Machine learning technique in which an agent learns to behave in an environment by performing the actions and seeing the results of actions. For each good action, the agent gets positive feedback, and for each bad action, the agent gets negative feedback or penalty.

Types

- Q-learning and
- SARSA (State-Action-Reward-State-Action)



THANK YOU