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**What is machine learning?**

**Definition**

Machine learning is the study of algorithms and statistical data that enable a computer system to be more accurate in predicting the outcomes without any programming. When there is new data, the system automatically updates the new output prediction. Machine learning could be compared to a child who is learning steps by steps and it is slowly more mature in decision making.

**How does it work?**

Machine learning divides into 2 type of techniques which are supervised learning and unsupervised learning. In type 1, the supervised learning trains a model on a given input and output data so that it can predict the future output. The data analyst uses different variables, different features, and various model to program an algorithm for predictive purposes. After the training is done, the algorithm will apply what it has learned to the data input. In type 2, the unsupervised learning can learn a hidden pattern or intrinsic structure input in data. It does not need to be trained with the outcome data. It uses mathematical equations or computation process to produce a deep learning of the data input. Then, it can automatically understand the pattern and arrive at a conclusion. The unsupervised learning algorithm is also called a neural network which uses more difficult and more complex processing than supervised learning algorithm, which includes image recognition, speech-to-text, and natural language generation. These unsupervised learning algorithms require a massive amount of data to be able to predict with accuracy. There are five steps to produce an algorithm for machine learning. Firstly, the data analyst must identify a data set and prepares them for analysis. Secondly, he must choose what type of algorithm to use. Thirdly, he needs to make an analytical model based on the used algorithm. Fourthly, he needs to train the model to test the data set again and again. Fifthly, run the model to find the result and other findings.

**Type of machine learning algorithm and its application**

For supervised learning, there are two techniques which are classification and regression. The classification technique predicts discrete responses. Classification identifies a group data and groups them into different categories. Some of the application is medical imaging or speech recognition. Some of the common algorithms used for this model are support vector machine (SVM), decision trees, logistic regression, and neural networks. Regression predicts continuous responses. The data analyst uses regression technique if he is working with a range of data or numerical data. Some of the common algorithms are liner model, decision tree, neural network, nonlinear model, and adaptive neuro-fuzzy learning. For unsupervised learning, the most common technique is clustering. It uses implicit and explicit data analysis process to find hidden patterns or groups in data. Some of the applications for cluster model are gene sequence analysis, market research, and object recognition. Some of the common algorithms are K-means clustering and K-medoids, hierarchical clustering, Gaussian mixture models, hidden Markov models, self-organizing maps, fuzzy c-means clustering, and subtractive clustering.

**Final thoughts**

Machine learning is very important in both the economic boom and recession because it can analyze data input and benefits the company in many ways such as provide a desired predictive output with the help of analytical tools and different use of algorithm models.