Generative & Discriminative Models

Machine learning models can be classified intotwo types of models :

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| **Discriminative** | **Generative** |
| Discriminative models also known as **conditional models,** learn the boundaries between classes or labels in a dataset. Discriminative models **separate classes.** | Generative models use **probability estimates** and **likelihood** to model data points and differentiate between different class labels present in a dataset. |
| The discriminative model refers to a class of models used in **Statistical Classification**, mainly used **for supervised machine learning**. **If we have some outliers** present in the dataset, then **discriminative models work better** compared to generative models i.e, discriminative models are more robust to outliers. However, there is one major drawback of these models is the **misclassification problem** | Generative models are considered as a class of statistical models that can **generate new data instances**. These models are used in **unsupervised machine learning.** However, if there is a presence of outliers in the dataset, then it affects these types of models to a significant extent. |
| Some Examples of Discriminative Models  * ‌Logistic regression * Scalar Vector Machine (SVMs) * ‌Traditional neural networks * ‌Nearest neighbor * Conditional Random Fields (CRFs) * Decision Trees and Random Forest | Some Examples of Generative Models  * Probability and Likelihood estimation, * Modeling data points, * To describe the phenomenon in data, * To distinguish between classes based on these probabilities. |