

# Generative vs. Discriminative Classifiers

- **Generative** classifiers (learn **what the data “looks”** like in each category)
  - Attempt to model  $p(X,Y) = p(Y)p(X|Y)$  and compute  $p(Y|X)$  based on  $p(X|Y)$  and  $p(Y)$  by using Bayes Rule
  - Objective function is likelihood, thus indirectly measuring training errors
  - E.g., Naïve Bayes
- **Discriminative** classifiers (learn **what features separate categories**)
  - Attempt to model  $p(Y|X)$  directly
  - Objective function directly measures errors of categorization on training data
  - E.g., Logistic Regression, Support Vector Machine (SVM), k-Nearest Neighbors (kNN)