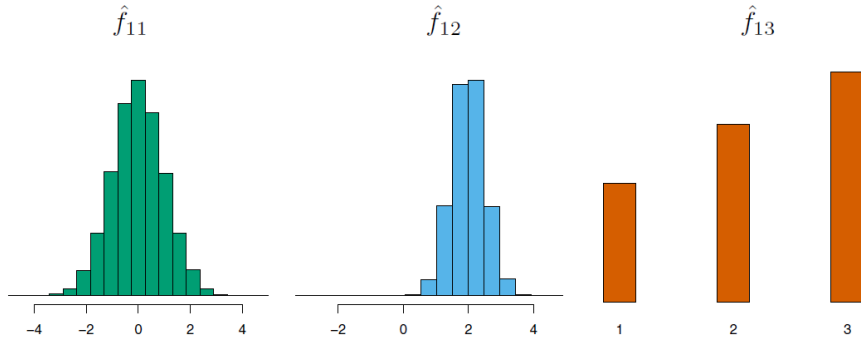


Example: Naïve Bayes Classifier with $p=3$ predictors (X_1, X_2, X_3) and $K=2$ classes ($Y=1$ or $Y=2$)

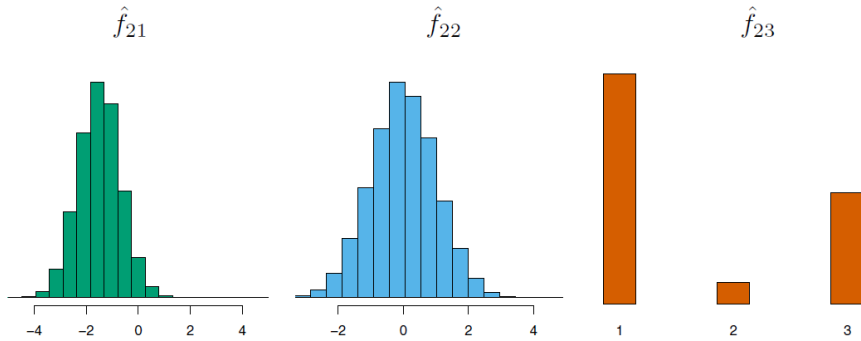
Variables X_1 and X_2 are Continuous; X_3 is Discrete (with possible outcomes 1,2,or 3)

Classifying the observation vector: $x^* = (.4, 1.5, 1)'$

Density estimates for class $k=1$



Density estimates for class $k=2$



$$x^* = (x_1^*, x_2^*, x_3^*) = (.4, 1.5, 1)'$$

$$P(Y=k \mid X=x^*) = f_{k1}(x_1^*) \cdot f_{k2}(x_2^*) \cdot f_{k3}(x_3^*) \cdot \pi_k / \sum_k (f_{k1}(x_1^*) \cdot f_{k2}(x_2^*) \cdot f_{k3}(x_3^*) \cdot \pi_k)$$