Gaussian Naive Bayes is a simple probabilistic classifier that uses Bayes theorem with independent assumptions between the features to classify data. Let, the classifier has m elements which is denoted with X =X_1, X_2, ... , X_m and n classes which is denoted with C = c_1, c_2, ... , c_n. The Bayes theorem is stated in following equation,

$$P(C_i — X_j) = \frac{P(X_j|C_i)*P(X_i)}{P(X_j)}$$

Here,
C_i = Denotes the class
X_j = Denotes a single featured element
P(A — B) = Denotes the probability of observing A after B is observed.
P(A) = Denotes the probability of observing A
For multiple feature the equation is changed to,

$$P(C_i — x_1,x_2,x_3, ... , x_n) = \frac{P(x_1|C_i)*P(x_2|C_i)*...*P(x_n|C_i)}{P(X_j)}$$

Here,
x_1,x_2,x_3, ... , x_n are features of X_j.
Gaussian Naive Bayes is really fragile to over fitting without any regularization assumption. Also, it is based on naive assumptions that re not generally concordant with the data.

1 Gaussian Naive Bias