Bernoulli Naive Bayes

$$P(A|B) = \frac{P(B|A)\,P(A)}{P(B)}$$

P(A|B) = Probability of A given B
P(B|A) = Probability of B given A
P(A) = Probability that A will occur.
P(B) = probability that B will occur.

Confident	Studied	Sick	Result.
yes	No	No	Fail
yes	No	yes	Pass
No	Yes	yes	Fail
No	Yes	No	Pass
yes	yes	yes	Pass

step 1 -

Calculate Class probabilites

P(Pass) = 3/5
P(fail) = 2/5

Step 2 -

Calculate Individual probability with Respect to each features.

P(Confident = yes | Result = Pass) = 2/3
P(Studied = yes | Result = Pass) = 2/3
P(Sick = yes | Result = Pass) = 1/3

Similarly,

P(Confident = Yes | Result = Fail) = 1/2
P(Studied = Yes | Result = Fail) = 1/2
P(Sick = Yes | Result = Fail) = 1/2

Step 3 -

P(X | Result = Pass) × P(Result = Pass) =
(2/3) × (2/3) × (1/3) × (3/5) = 0.088

P(X | Result = Fail) × P(Result = Fail) =
(1/2) × (1/2) × (1/2) × (2/5) = 0.05

Step 4 -

Calculate probability of estimator
P(X) = P(Confident = Yes) × P(Studied = Yes) ×
P(Sick = No) = (3/5) * (3/5) * (2/5)
= 0.144

Step 5 -

P(Result = Pass | X) = 0.088 / 0.144 = 0.611
P(Result = Fail | X) = 0.05 / 0.144 = 0.34

Result →

As 0.611 > 0.31
Instance with
Confident = Yes, Studied = Yes, Sick = No
Result is 'Pass'