Imagine you work for a bank and you want to predict whether a loan applicant will default on their loan or not based on some demographic and financial data. Here is a sample dataset containing 10 loan applicants and whether they defaulted on their loan or not:

Applicant ID	Age	Income	Education Level	Defaulted
1	25	20,000	High School	No
2	35	50,000	Bachelor's	No
3	45	80,000	Master's	No
4	28	22,000	High School	No
5	32	45,000	Bachelor's	Yes
6	46	70,000	Master's	No
7	24	18,000	High School	Yes
8	38	60,000	Bachelor's	No
9	32	48,000	Bachelor's	No
10	29	25,000	High School	Yes

yes = 3

no = 7

Income = >=20,000 , 20,000-40,000 , 40,000-60,000 , 60,000-80,000

Age = 10-19 , 20-29 , 30-39 , 40-49

P (defaulted | age: 30-39 , income = 40,000-60,000 , Education = bachelor's)

Likelihood

P (age: 30-39 , income = 40,000-60,000 , Education = bachelor's || defaulted)

Yes P(age= 30-39 | yes) x P (income:40,000-60,000 | yes) x P(education = bachelor's | yes)

1/3 1/3 1/3

= 0.037

No P(age= 30-39 | no) x P (income:40,000-59,999 | no) x P(education = bachelor's | no)

3/7 2/7 3/7

= 0.052

Prior

Yes Defaulted = $\frac{3}{10}$ = 0.3

No Defaulted = $\frac{7}{10}$ = 0.7

P (X| defaulted= yes) x P (defaulted= yes) = 0.037 x 0.3 = 0.0111

P (X| defaulted= no) x P (defaulted= no) = 0.052 x 0.7 = 0.0367