Quiz 6. Naïve Bayes classifiers. Again

Consider the following dataset

N	Color	Type	Origin	Stolen?
1	red	sports	domestic	yes
2	red	sports	domestic	no
3	red	sports	domestic	yes
4	yellow	sports	domestic	no
5	yellow	sports	imported	yes
6	yellow	SUV	imported	no
7	yellow	SUV	imported	yes
8	yellow	SUV	domestic	no
9	red	SUV	imported	no
10	red	sports	domestic	yes

Classify **(red, SUV, domestic)** using Naïve Bayes classifier

For this you need:

P(Stolen=yes)=1/2

P(Stolen=no)=1/2

P(red|Stolen=yes)=3/5

P(red|Stolen=no)=2/5

P(SUV|Stolen=yes)=1/5

P(SUV|Stolen=no)=3/5

P(domestic|Stolen=yes)=3/5

P(domestic|Stolen=no)=3/5

Do NOT apply Laplace correction, and do NOT compute actual probabilities. Just give the odds for this car to be stolen vs. safe.

P(Stolen=yes | red, SUV, domestic)=α P(red|Stolen=yes) P(SUV|Stolen=yes)P(domestic|Stolen=yes) P(Stolen=yes)= α * 3/5*1/5*3/5*1/2

= α * 9/250

P(Stolen=no | red, SUV, domestic)=α P(red|Stolen=no) P(SUV|Stolen=no)P(domestic|Stolen=no) P(Stolen=no)= α * 2/5*3/5*3/5*1/2

= α * 18/250

Odds 2:1 that this car is safe (will NOT be stolen)