- Such a model is called a *generative model*
    - because it specifies the hypothetical random process that generates the data.

$$p(c|x) = \frac{p(x|c)p(c)}{p(x)}$$

- P(c|x) is the posterior probability of class (c, target) given predictor (x, attributes).
- P(c) is the prior probability of class.
- P(x|c) is the likelihood which is the probability of predictor given class.
- P(x) is the prior probability of predictor.

```
![](./img/Bayes_41.png)
```

Step 1: Convert the data set into a frequency table

Step 2: Create Likelihood table by finding the probabilities like:

- p(Overcast) = 0.29, p(rainy) = 0.36, p(sunny) = 0.36
- p(playing) = 0.64, p(rest) = 0.36

Step 3: Now, use Naive Bayesian equation to calculate the posterior probability for each class. The class with the highest posterior probability is the outcome of prediction.

Problem: Players will play if weather is sunny. Is this statement is correct?

We can solve it using above discussed method of posterior probability.

$P(Yes|Sunny) = \frac{P(Sunny|Yes)*P(Yes)}{P(Sunny)}$

Here we have P (Sunny |Yes) = 3/9 = 0.33, P(Sunny) = 5/14 = 0.36, P(Yes)= 9/14 = 0.64