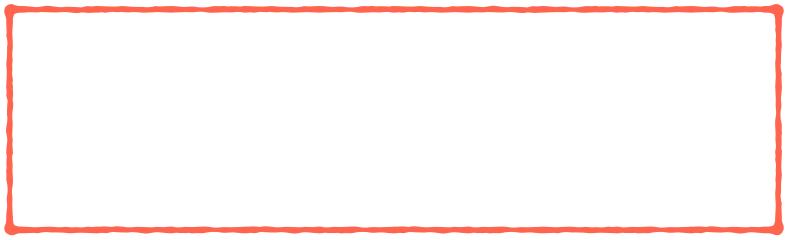


Conditional Probability Rule

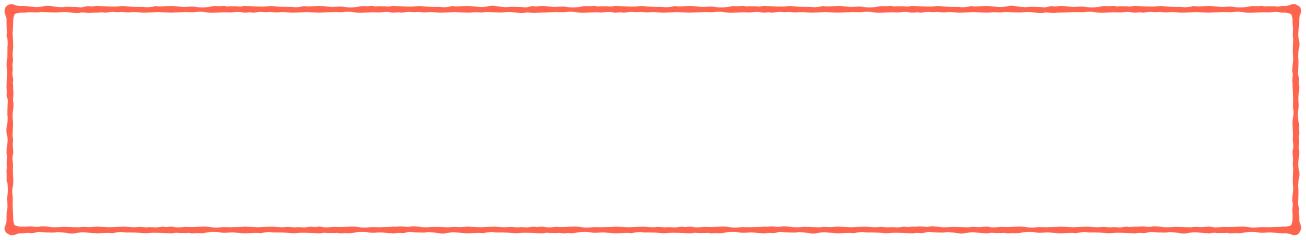
probability rules

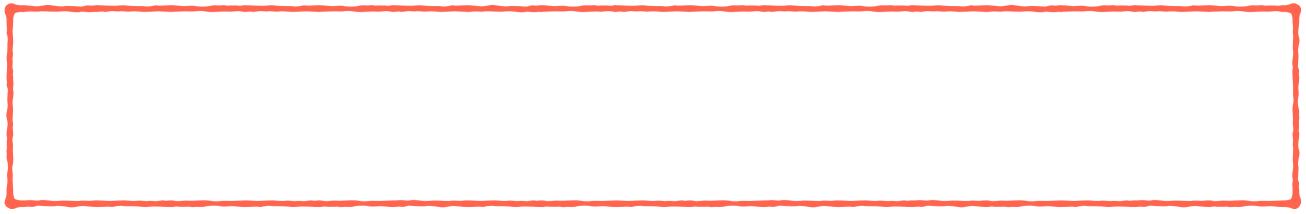


> The Multiplication Rule



Independent Events and Their Complement





probability rules

Conditional Probability Rule

If A and B are events in the sample space Ω , then the conditional probability of A given B where P(B)>0 is given by

$$P(A \mid B) = \frac{P(A \cap B)}{P(B)}$$

The Multiplication Rule

$$P(A \cap B) = P(A \mid B)P(B)$$

since
$$A \cap B = B \cap A$$

 $\implies P(A \cap B) = P(B)P(A \mid B)$

Independent Events and Their Complement

Two events A and B are independent if and only if $P(A \cap B) = P(A)P(B)$

Two events A and B are independent then A and \overline{B} are also independent.

probability rules

Complement Rule