Conditions

if there are 10 balls in a box (9 black and 1 white) what is the probability of pulling out a black ball 6 times in a row? Each time all balls are replaced so there is always 10 balls (9 black and 1 white). Basically I'm asking what is the probability of a 90% chance event happening six times in a row?

Solution

For solving this problem we can use the Classic Probability definition, which claims, that the probability of some event A is the rate of number of all favorable outcomes (when the event A is present) to a number of all possible outcomes.

All 6 pulling out balls are black. The probability of this is the probability of 6 independent events – to take a black ball from a set of 9 black and 1 white.

The probability of this event is 9/10.

The probability of this event will be present 6 time in a row is a product of probabilities (because the events are independent, as we replace each ball back)

$$P = \frac{9}{10} \cdot \frac{9}{10} \cdot \frac{9}{10} \cdot \frac{9}{10} \cdot \frac{9}{10} \cdot \frac{9}{10} = 0{,}531441$$

Answer: The probability of pulling out a black ball 6 times in a row is $0{.}531441$ (or, approximately, in 53,1441% of all cases)