Examples

We flip a fair coin three times. Each flip is independent. (both in the statistical independence sense and in the "doesn't affect the next one" sense).

Is $E = \{HHH\}$ independent of $F =$ "at most two heads"?

Are $A =$ "the first flip is heads" and $B =$ "the second flip is tails" independent?

Mutual Exclusion and Independence

Two of these statements are true, one is false. Explain to each other which ones are true and find a counter-example to the false one.

1. If A, B both have nonzero probability and they are mutually exclusive, then they cannot be independent.

2. If A has zero probability, then A, B are independent (for any B).

3. If two events are independent, then at least one has nonzero probability.