

Algebra of events

Let A, B, C be event associated with an experiment whose sample space is S

Complementary event: - for every event A their corresponds another event a' called the complementary event to A.

it is also called the event "not A"

e.g. take the experiment of tossing three coins.

$S = (HHH, HHT, HTH, THH, HTT, THT, TTH, TTT)$

Let $A = (HTH, HHT, THH)$ be the event 'only one tail appears'

$A' = (HHH, HTT, THT, TTH, TTT)$

Thus, the complementary event 'not A to the event A is A'

In general, $A' = \{w: w \in S \text{ and } w \notin A\}$

$A' = S - A$

2. The events A OR B

When the sets A and B are two events associated with a sample space then $A \cup B$ denoted the event A and B thus $A \cup B = \{w: w \in A \text{ and } w \in B\}$

3. the event A and B.

IF A and B are two events, then the set $A \cap B$ denotes the event A and B thus $A \cap B = \{w: w \in A \text{ and } w \in B\}$

4.The event A but not B

$A - B =$ set of all those elements which are in A but not in B

$A - B = A \cap B'$

$B' =$ not B.

Example: Let E be an experiment of rolling a die.

A= event pf getting a prime number

B= event of getting an odd number

Sample space $S = (1,2,3,4,5,6)$

$A = (2,3,5)$ $B = (1,3,5)$

Then A or B = $A \cup B = (1,2,3,5)$

A and B = $A \cap B = (3,5)$

A but not B = $A - B = (2)$

Not A = $A' = (1,4,6)$