Brief Notes #1
Events and Their Probability

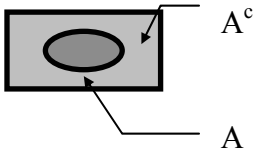
- **Definitions**

  Experiment: a set of conditions under which some variable is observed
  Outcome of an experiment: the result of the observation (a sample point)
  Sample Space, S: collection of all possible outcomes (sample points) of an experiment
  Event: a collection of sample points

- **Operations with events**

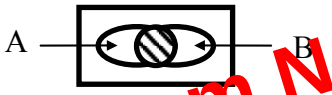
  1. **Complementation**

  A^c 

  2. **Intersection**

  $A \cap B$ 

  3. **Union**

  $A \cup B$ 

- **Properties of events**

  1. Mutual Exclusiveness - intersection of events is the null set ($A_i \cap A_j = \varnothing$, for all $i \neq j$)
  2. Collective Exhaustiveness (C.E.) - union of events is sample space ($A_1 \cup A_2 \cup ... \cup A_n = S$)
  3. If the events $\{A_1, A_2, ... , A_n\}$ are both mutually exclusive and collectively exhaustive, they form a partition of the sample space, S.

- **Probability of events**

  - Relative frequency f_E and limit of relative frequency F_E of an event E

  $$f_E = \frac{n_E}{n}$$

  $$F_E = \lim_{n\to\infty} f_E = \lim_{n\to\infty} \frac{n_E}{n}$$

  - Properties of relative frequency (the same is true for the limit of relative frequency