Concepts and Formulas to Remember

— Lecture 1.

* Random Experiment.
  - It can be carried out any number of times under identical condition.
  - In these experiments, the possible set of outcomes is known.
    * But the outcome of any individual trial is unknown till it is executed.

* Infinite Sample Space:-
  - Toss a coin repeatedly until we get H. Count the number of tosses required to get the first H.

H TH TTH TTTH --- T...TH.
1 2 3 4 ↓ n-1 tails. (n)

$\Omega = \{1, 2, 3 - - - \} \rightarrow$ infinite.

* Uncountable Sample Space:-
  - We pick a point from the interval (0,1) Number of possible ways of selection is infinite.
  - More importantly, it is <u>not countable.</u>

Note: An infinite set Ω is said to be countable if there is a 1 to 1 mapping between the elements of Ω and the set of natural numbers.

if such mapping does not exist, then it is uncountable.

* In general, if there are n identical balls to be put in k boxes such that none of the box is empty, then the number of possible ways $= {}^{n-1}C_{k-1}$.