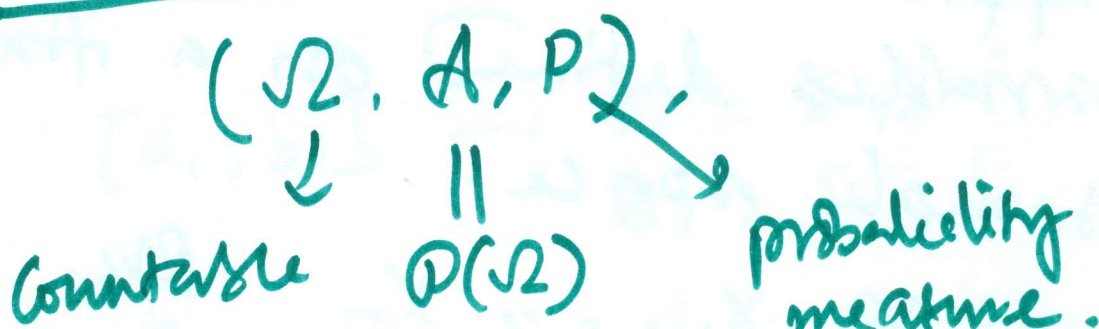


Probability & Statistics

LS

Discrete Random Variables.



$$X: \Omega \rightarrow \mathbb{R}$$

Expected value of a random variable.

$$E(X) = \sum_{j=1}^{\infty} x_j \cdot p(x = x_j)$$

$$x(j) = X(\omega_j), \quad \omega_j \in \Omega$$

~~nothing to do.~~
not much to do with
~~but~~ outcomes but the
values of the outcomes
and the prob. of obtaining
that value!!!

Random Vectors.

Suppose we have 'n' random variables defined on a 'fixed' sample space.

X_1, X_2, \dots, X_n RVs.

$X_j : \Omega \rightarrow \mathbb{R} \quad \forall j=1:n$

$\vec{X} = (X_1, X_2, \dots, X_n)$

$\vec{X} : \Omega \rightarrow \mathbb{R}^n$

\downarrow
 $\omega \in \Omega, \vec{X}(\omega)$

$= (X_1(\omega), X_2(\omega), \dots, X_n(\omega))$

Borel ~~set~~: σ -field: the σ -field generated by $\prod_{j=1}^n [a_j, b_j]$.

\vec{X} is a RV if $\vec{X}^{-1}(B) \in \mathcal{A}$.

