Probability

- If A and B are independent:
  $P(A\cap B) = P(A)\,P(B)$
- $P(A/_B) = \frac{P(A\cap B)}{P(B)}$
- $P(A\cap B) = P(A/_B)\,.\,P(B)$
- $\overline{A\cap B} = \overline{A} \cup \overline{B}$ $\qquad$ $\overline{A\cup B} = \overline{A} \cap \overline{B}$
- $P(\overline{A}) = 1 - P(A)$
- P (at least one __) = 1 – P (no__)
- Randomly and simultaneously: $C_n^r = \frac{n!}{r!(n-r)!}$
- Successively: with replacement $\frac{}{T}\,.\,\frac{}{T}$ ....

  without replacement $\frac{}{T}\,.\,\frac{}{T-1}$ ....
- $P(A\cap \overline{B}) = P(A) - P(A\cap B)$
- $P(B) = P(B\cap A_1) + P(B\cap A_2) + \ldots\ldots$
- In the case of tree:

$$A \begin{cases} B \rightarrow B/_A \\ \overline{B} \rightarrow \overline{B}/A \end{cases}$$

if the question is find P(B)

$P(B) = P(B\cap A) + (B\cap \overline{A})$

$= P(B/_A)\,.P(A) + P(B/\overline{A}).P(\overline{A})$

$$\overline{A} \begin{cases} B \rightarrow B/\overline{A} \\ \overline{B} \rightarrow \overline{B}/\overline{A} \end{cases}$$

- $P(\overline{A}/B) = 1 - P(A/B)$

X_i			
$P(X_i)$			

$E(x) = \Sigma x_i p(x_i)$ $\qquad$ E(x): Expected Value.

- In the case of table:

	B		
A			

$P(A\cap B)$