Indep: $Pr[X \cap Y] = Pr[X] \cdot Pr[Y]$

$\frac{Pr[X \cap Y]}{Pr[X]} = Pr[Y|X]$

$x \quad y \quad z$

$\frac{1}{4}$

Pairwise independence $\frac{1}{4}$ is How they are independent?

Expectation

Distribution

PDF

$Pr[X=x]$

Not the continuous bc $Pr[X=x]$ will be zero

PDF of continuous random variable

$f_X(x)$ 라고 해야 함.

CDF

$Pr[X \leq x] \to$ CDF of X

$E[(X - E[X])^2]$

$= \int \underline{x^2 - 2xE[X]} + E[X]^2 f(x)\, dx$

$\hookrightarrow E[X^2] - 2E[X]^2$

$E[X \cdot E[X]] = E[X] \cdot E[X]$

Taking expectation out.

$E[X^2] - 2 \cdot \underline{E[XE[X]]} + E[X]^2$

$= 2 \cdot E[X] \cdot E[X]$

$= E[X^2] - 2E[X]^2 + E[X]^2$

$= E[X^2] - E[X]^2$

Covariance

Properties

$Cov(X+c, Y) = Cov(X, Y)$

$Cov(aX + bY, Z) = \underline{a \cdot Cov(X, Z)} + b \cdot Cov(Y, Z)$

$Cov(aX, Z) \quad Cov(bY, Z)$

$Cov(W, Z) = Cov(1 + X + XY^2, 1 + X)$ $\quad N(0,1)$

$= Cov(X, X + XY^2)$

$= Cov(X(1+Y^2), X) = \underline{Cov(X, X)} + \underline{Cov(X, XY^2)}$

$= 1?$

Kai square

$E[X \cdot Y^2] = 0$

$\hookrightarrow E[X - \underline{E[X]}](XY^2 - E[XY^2])$

$0 \quad 0 = E[X^2 Y^2]$

$E[X^2Y^2] = E[X^2] \cdot E[Y^2]$

$= 1$

$\int_0^{\infty} (-X \cdot Y^2 + X \cdot Y^2)\, dx = 0$

$E[XY] = E[A] \cdot E[B]$

$= \iint x \cdot y \cdot f_{XY}(x,y)\,dx\,dy$ independent

$= \iint x \cdot y \cdot f_X(x) f_Y(y)\,dx\,dy$

$= \iint x \cdot f_X(x)\,dx \cdot y \cdot f_Y(y)\,dy$

$= \int x \cdot f_X(x)\,dx \int y \cdot f_Y(y)\,dy$

$\underbrace{E[X^2]}_{} \overset{=1}{} \cdot E[Y^2] \overset{=1}{}$

↳ variance $+ E[X]^2$

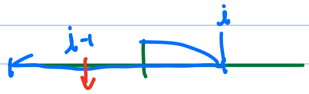
$E[X^2] - E[X]^2$

$1 \quad 0 \quad 0$

Secretary problem.

22

The best of the first $i-1$ applicants is in the first $r-1$ application



i 보다 작다
작은 수가 r-1 안에 있어야 한다!!!