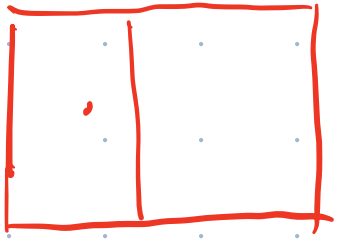
Continuous R.V. Distribution.

X has infinite possible outcome

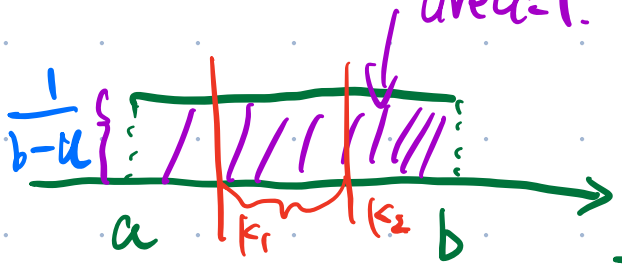
1) $P(X=k)=0$



2) 只有X取一个范围才有概率.

Special distributions for Continuous R.V.

1) uniform distribution.



$$P(k_1 \le X \le k_2) = \frac{k_2 - k_1}{b-a}$$

有正

$$E(X) = \frac{b-a}{2}$$

$$Std(X) = \frac{b-a}{\sqrt{12}}$$

area → proportion / probability / percentage / percentile

2) normal distribution.

有其它，求 area，用 normalcdf.

有 area，求其它，用 invNorm.

$Z = aX + bY + c$.　　$Z = aX$

$E(Z) = E(aX + bY + c)$

$= E(aX) + E(bY) + E(c)$

$= aE(X) + bE(Y) + C$.

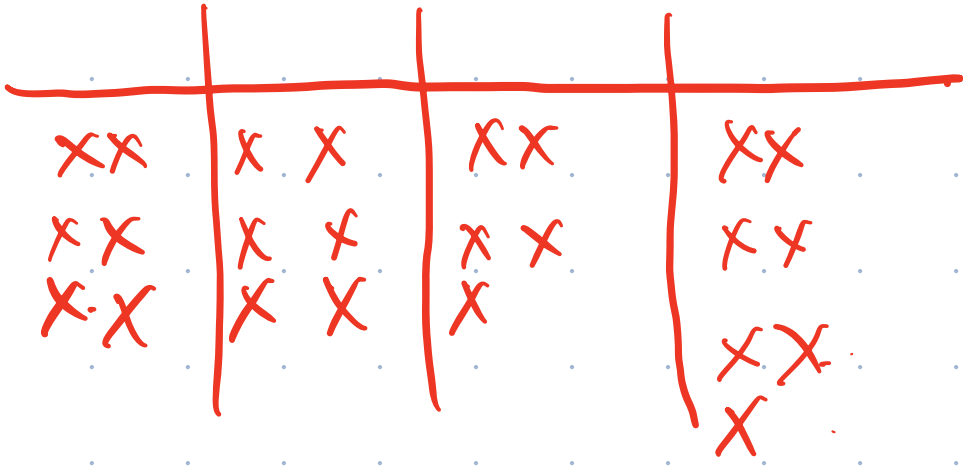
$$Var(Z) = Var(aX + bY + c)$$

$$= Var(aX) + Var(bY) + Var(c)$$

$$= a^2 Var(X) + b^2 Var(Y) \qquad Var(c) = 0$$

$$Std(Z) = \sqrt{Var(Z)} = \sqrt{a^2 Var(X) + b^2 Var(Y)}$$

$$= \sqrt{a^2 Std^2(X) + b^2 Std^2(Y)}$$



Squared deviation

$$Var(X) = \sum p_i \left| (x_i - \mu_X)^2 \right| \quad x_i - \mu_X$$

deviation.

$$Std(X) = \sqrt{Var(X)}$$

$$Y = 0.54M + 0.46W$$

54% M 20.7

46% W 20.2.

$$E(Y) = 0.54 \times 20.7 + 0.46 \times 20.2.$$

1) $150+50\left[0.05\times1+2\times0.1+3\times0.22+4\times0.3+5\times0.18+6\times0.12+7\times0.03\right]$.

$= 150+50\times 3.47$

$= 347$.

$X \quad Z = aX$

$E(Z) = E(aX) = aE(X)$

$Std(Z) = \sqrt{a^2 Std^2(X)}$

$= |a| Std(X)$

$W = 7 + 2X$

$E(W) = E(7 + 2X) = 7 + 2E(X)$

$= 7 + 2 \times 12 = 31$

$Std(W) = Std(7+2X) = Std(2X)$

$= 2\,Std(X)$

$= 2 \times 3 = 6$

$E(D) = 2.6$

$Var(D) = 3.6$

$Std(P) = Std(1.5D)$

$C_N = A_N - B_N$ $P(A \cdot B > 0)$

$E(C) = E(A - B) = E(A) - E(B)$

$= -15.$

$Std(C) = \sqrt{Std^2(A) + Std^2(B)}$

$= 33.54.$

$\text{normalcdf}\left(\begin{matrix} 0 \\ 1E99. \\ -15 \\ 33.54 \end{matrix}\right)$