Average or mean $=\frac{\Sigma x}{n}$

Max : اعلى قيمة

Min : اقل قميه

Range = Max-Min

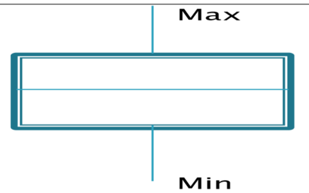
Location of Q2 (Median)((50%) = $\frac{n+1}{2}$

Location of Q3 (75%) = $\frac{3(n+1)}{4}$

Location of Q1 (25%) = $\frac{n+1}{4}$

Trimmed mean = n* percentage (%)

IQR=Q3-Q1



Percentage = (n+1) * النسبه المئويه

Q2 = Lm+ $\left(\frac{\frac{n}{2}+fim}{fi}\right) * H$ (For Groups)

$P=\frac{n}{N}$

n=n1*n2*n3*..

$Pnr=\frac{n!}{(n-r)!}$

$P=\frac{n!}{n1!*n21*n3!}$

P= (n-1)!

$\binom{n}{r}=\frac{n!}{r!*(n-r)!}$

P(A∪ B) = P(A)+P(B) − P(A∩ B)

P(A∪ B ∪ C) = P(A)+P(B)+P(C) − P(A∩ B ∩ C)

IF A,B **mutually exclusive** : P(A∪ B) = P(A)+P(B)

IF A,B,C mutually exclusive : P(A)+P(B)+P(C)

IF A,B **independent** : P(A∪ B) = P(A)+P(B) − P(A)*P(B)

Conditional probability :

P(A/B) = $\frac{P(A\cap B)}{P(B)}$ P(B/A) = $\frac{P(A\cap B)}{P(A)}$

Bays Rule :

P(D)=P(C)*P(D/C) + P(A)*P(D/A) + P(C)*P(D/A)

إحتماليه الخراب من فريق محدد

P(A/D) = $\frac{P(A)*P(D/A)}{P(D)}$

Constants :

$\Sigma fx = 1$

$\Sigma\Sigma f(x,y) = 1$

$\int_{-\infty}^{\infty} fx.dx = 1$

$\iint_{-\infty}^{\infty} f(x,y)\,dx\,dy = 1$

Probability :

P(X=x) = f(x)

f(x) = F(X)-F(X-1)

P(X≤ x) = F(x)

P(X≥ x) = 1 − F(x-1)

P (a< x < b) = $\int_a^b fx.dx = 1$

P (a< x < b) = F(b) − F(a)

P $(-\infty < x < \infty \ and \ -\infty < y < \infty) = \iint_{-\infty}^{-\infty} f(x,y).dxdy$

Marginal :

g(x) = $\Sigma_y f(x.y)$

h(y) = $\Sigma_x f(x.y)$

g(x) = $\int_{-\infty}^{\infty} f(x,y).dy$

h(y) = $\int_{-\infty}^{\infty} f(x,y).dx$

Variance :

$\sigma^2 = E(X^2) - (E(X))^2$ $\sigma^2 = E(g(x)^2) - (E(g(X))^2$

Co-Variance : $\sigma_{xy} = E(XY) - E(X)E(Y)$

Correlation Coefficient :

$\rho_{XY} = \frac{\sigma_{XY}}{\sigma_X\sigma_X}$

Conditional :

f(y/x) = $\frac{f(x,y)}{g(x)}$ f(x/y) = $\frac{f(x,y)}{h(y)}$

Expected Value :

E(X) = $\Sigma x f(x)$

E(g(X)) = $\Sigma x g(x)$

E(x) = $\int_{-\infty}^{\infty} x f(x).dx$

E(g(x)) = $\int_{-\infty}^{\infty} x g(x).dx$

E(g(x,y)) = $\Sigma_x \Sigma_y f(x,y)$

E(g(x,y)) = $\iint_{-\infty}^{\infty} g(x,y)f(x,y)dxdy$

Expected Value and Variance :

E (ax) = a(x) + b

E(g(x)+h(x)) =E((g(x)) + E((h(y))

$\sigma^2{}_{ax+by+c} = a^2\sigma^2{}_x + b^2\sigma^2{}_y + 2ab\sigma_{xy}$

$\sigma^2{}_{ax+by} = a^2\sigma^2{}_x + b^2\sigma^2{}_y$

$\sigma^2{}_{ax-by} = a^2\sigma^2{}_x + b^2\sigma^2{}_y$

Bionomial Distribution

$$B(x,n,p) = \binom{n}{x} p^x q^{n-x}$$

$q = 1 - p$

$Mean\ M = np$

$Variance\ \sigma^2 = npq$

Hypergeometric Distribution

$$h(x,N,n,k) = \frac{\binom{k}{x}\binom{N-k}{n-x}}{\binom{N}{n}}$$

$$M = \frac{nk}{N}$$

$$\sigma^2 = \frac{N-n}{N-1} \times n \times \frac{k}{N}\left(1 - \frac{k}{N}\right)$$

Negative Bionomial Distribution

$$b(x,k,p) = \binom{x-1}{k-1} p^k q^{x-k}$$

$$M = \frac{k}{p}$$

$$\sigma^2 = \frac{kq}{p}$$

Geometric Distribution

$$g(x,p) = pq^{x-1}$$

$$M = \frac{1}{p}$$

$$\sigma^2 = \frac{1-p}{p}$$

Poisson Distribution

$$p(x,\lambda) = \frac{e^{-\lambda}(\lambda)^x}{x!}$$

$M = \lambda$

$\sigma^2 = \lambda$

Density Function of CUD

$$p(a < x < b) = \int_a^b \frac{1}{b-a}\,dx$$

$$M = \frac{A+B}{2}$$

$$\sigma^2 = \frac{(B-A)^2}{12}$$

Normal Distribution

$$f(x) = \frac{1}{\sqrt{2\pi\sigma}} e^{-\frac{1}{2}\frac{(x-M)^2}{\sigma^2}}$$

$Mode = Mean = Median$

$x = M \pm \sigma$

$Area = 1$

Standard Normal Distribution

$$z = \frac{x-M}{\sigma}$$

$Right\ of\ zero = M + n\sigma$

$Left\ of\ zero = M - n\sigma$

$M = 0$

$\sigma^2 = 1$

Normal Approximation Bionomial

$$z = \frac{x-np}{\sqrt{npq}}$$

$M = np$

$\sigma^2 = npq$

Chebyshev's Theorem

$M - k\sigma \ , M + k\sigma$

$$Left = \frac{1}{2k^2}$$

$$Middle = 1 - \frac{1}{k^2}$$

$$Right = \frac{1}{2k^2}$$

Exponential Distribution

$$f(x,\beta) = \frac{e^{-\frac{x}{\beta}}}{\beta} \quad , x > 0$$

$\propto = 1$

$M = \beta$

$\sigma^2 = \beta^2$