

Alphabetical Statistical Symbols:

Symbol	Text Equivalent	Meaning	Formula	Link to Glossary (if appropriate)
a		Y- intercept of least square regression line	$a = \bar{y} - b\bar{x}$, for line $y = a + bx$	Regression: y on x
b		Slope of least squares regression line	$b = \frac{\sum (x - \bar{x})(y - \bar{y})}{\sum (x - \bar{x})^2}$ for line $y = a + bx$	Regression: y on x
B (n, p)	Binomial distribution with parameters n and p	Discrete probability distribution for the probability of number of successes in n independent random trials under the identical conditions.	If X follows B (n, p) then, $P(X = r) = {}^n C_r p^r (1 - p)^{n-r}$, Where, $0 < p < 1$, $r = 0, 1, 2, \dots, n$	Binomial Distribution
c		Confidence level	$c = P(-z_c < Normal(0,1) < z_c)$	Confidence interval
${}^n C_r$	n-c-r	Combinations (number of combinations of n objects taken r at a time)	${}^n C_r = \frac{n!}{r!(n-r)!}$, where $n \geq r$	
$C_{n,r}$	n-c-r	Combinations (number of combinations of n objects taken r at a time)	$C_{n,r} = \frac{n!}{r!(n-r)!}$, where $n \geq r$	
Cov (X, Y)	Covariance between X and Y	Covariance between X & Y	$Cov(X) = E[(X - E(X))(Y - E(Y))]$	
CV		Coefficient of variation	$CV = \frac{\text{Standard Deviation}}{\text{Arithmetic mean}}$	
df		Degree(s) of freedom		

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E		Maximal error tolerance	$E = z_c \frac{\sigma}{\sqrt{n}}$ for large samples.	
E (f(x))	Expected value of f(x)		$E(f(x)) = \sum f(x)P(x)$	
f		Frequency	f = number of times score.	
F		F-distribution variable	$F = \frac{\chi_1^2 / n_1}{\chi_2^2 / n_2}$ where n_1 and n_2 are the corresponding degrees of freedom.	F-distribution, Hypothesis testing for equality of 2 variances.
F(x) or F_x		Distribution function	$F_x = \int_{-\infty}^x f_x dx$	
f(x) or f_x		Probability mass function	Depends on the distribution. $f_x \geq 0$ & $\int_x f_x dx = 1$.	
H_0	H-naught	Null hypothesis.	The null hypothesis is the hypothesis about the population parameter.	Testing of hypothesis
H_1	H-one	Alternate hypothesis.	An alternate hypothesis is constructed in such a way that it is the one to be accepted when the null hypothesis must be rejected.	Testing of hypothesis
IQR		Interquartile range	$IQR = Q_3 - Q_1$	Measures of central tendency.
MS	M-S	Mean square	$MS = \frac{SS}{df}$	Analysis of variance (ANOVA)
n		Sample size.	n = number of units in a sample.	
N		Population size	N = Number of units in the population.	

Symbol	Text Equivalent	Meaning	Formula	Link to Glossary (if appropriate)
$P_{n,r}$	n-p-r	Permutation (number of ways to arrange in order n distinct objects taking them r at a time)	$P_{n,r} = \frac{n!}{(n-r)!}$, where $n \geq r$	
${}_n P_r$	n-p-r	Permutation (number of ways to arrange in order n distinct objects taking them r at a time)	${}_n P_r = \frac{n!}{(n-r)!}$, where $n \geq r$	
\hat{p}	p-hat	Sample proportion	$\hat{p} = \frac{\text{number of success}}{\text{number of trials}}$	Binomial distribution
P (A B)	Probability of A given B	Conditional probability	$P(A B) = \frac{P(A \cap B)}{P(B)}$	
P (x)	Probability of x	Probability of x	$P(x) = \frac{\text{No.of favorable outcomes}}{\text{Total no.of outcomes}}$	
p-value		The attained level of significance.	P value is the smallest level of significance for which the observed sample statistic tells us to reject the null hypothesis.	
Q		Probability of not happening of the event	$q = 1 - p$	
Q_1	Q-one	First quartile	Q_1 = Median of the lower half of the data that is data below median.	Measures of central tendency
Q_2	Q-two	Second quartile Or Median	Q_2 = Central value of an ordered data.	Measures of central tendency
Q_3	Q-three	Third quartile	Q_3 = Median of the upper half of the data that is data above the median.	Measures of central tendency

Symbol	Text Equivalent	Meaning	Formula	Link to Glossary (if appropriate)
R		Sample Correlation coefficient	$r = \frac{Co\ variance(X, Y)}{[SD(X)] * [SD(Y)]}$	
r^2	r-square	Coefficient of determination	$r^2 = (Correlation\ coefficient)^2$	
R^2	r-square	Multiple correlation coefficient	$R^2 = 1 - \frac{mean\ square\ error}{S_y^2}$	
S		Sample standard deviation	$s = \sqrt{\frac{\sum (x - \bar{x})^2}{n - 1}}$ for ungrouped data. $s = \sqrt{\frac{\sum f(x - \bar{x})^2}{(\sum f) - 1}}$ for grouped data.	Measures of dispersion
S^2	S-square	Sample variance	$S^2 = \frac{\sum (x - \bar{x})^2}{n - 1}$ for ungrouped data. $S^2 = \frac{\sum f(x - \bar{x})^2}{(\sum f) - 1}$ for grouped data	Measures of dispersion
S_e^2	s-e- square	Error variance	$S_e^2 = \frac{sum\ of\ squares\ of\ residuals}{n}$	
SD		Sample standard deviation	$s = \sqrt{\frac{\sum (x - \bar{x})^2}{n - 1}}$ for ungrouped data. $s = \sqrt{\frac{\sum f(x - \bar{x})^2}{(\sum f) - 1}}$ for grouped data.	
sk _b		Bowley's coefficient of skewness	$sk_b = \frac{(Q_3 - Q_2) - (Q_2 - Q_1)}{(Q_3 - Q_1)}$	Measures of skewness
sk _p		Pearson's coefficient of skewness	$sk_p = \frac{Mean - Mode}{S\ tan\ dard\ Deviation}$	Measures of skewness

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SS_x		Sum of Squares	$SS_x = \sum (x - \bar{x})^2$ for ungrouped data. $SS_x = \sum f(x - \bar{x})^2$ for grouped data.	
t		Student's t variable.	$t = \frac{Normal(0,1)}{\sqrt{\chi_n^2/n}}$	t-distribution
t_c	t critical	The critical value for a confidence level c.	t_c = Number such that the area under the t distribution for a given number of degrees of freedom falling between $-t_c$ and t_c is equal to c.	Testing of hypothesis
Var (X)	Variance of X	Variance of X	$Var (X) = E (X - \mu)^2$	
x		Independent variable or explanatory variable in regression analysis	Eg. In the study of, yield obtained & the irrigation level, independent variable is, X= Irrigation level.	
\bar{x}	x-bar	Arithmetic mean or Average of X scores.	$\bar{x} = \frac{\sum x}{n}$ for ungrouped data. $\bar{x} = \frac{\sum fx}{\sum f}$ for grouped data.	Measures of central tendency
y		Dependent variable or response variable in regression analysis	Eg. In the study of, yield obtained & the irrigation level, dependent variable is, Y= Yield obtained.	
Z	Z-score	Standard normal variable (Normal variable with mean = 0 & SD = 1)	$z = \frac{x - \mu}{\sigma}$, where X follows Normal (μ, σ).	Standard normal distribution
z_c	z critical	The critical value for a confidence level c.	z_c = Number such that the area under the standard normal curve falling between $-z_c$ and z_c is equal to c.	Testing of hypothesis Confidence interval

Greek Statistical Symbols:

Symbol	Text Equivalent	Meaning	Formula	Link to Glossary (if appropriate)
α	Alpha	Type I error or Level of Significance.	$\alpha = P$ [Rejecting the null hypothesis Null hypothesis is true].	Hypothesis Testing
β	Beta	Type II error or Power of the test.	$\beta = P$ [Accepting the null hypothesis Null hypothesis is False].	Hypothesis Testing
ϵ	Epsilon	“Error Term” in regression/statistics; more generally used to denote an arbitrarily small positive number	$y = \beta_0 + \beta_1 *x + \epsilon$	Regression
χ^2	Chi-square	Chi-square distribution	$\chi^2 =$ Sum of n independent Standard normal variables	Chi-square distribution.
χ^2	Chi-square	Chi-square distribution	$\chi^2 = \sum \frac{(O - E)^2}{E}$ where O is the observed frequency and E is the expected frequency. Or $\chi^2 = \frac{(n-1)s^2}{\sigma^2} (?)$	Goodness of fit test
$\Gamma(n)$	Gamma-n	Gamma function	$\Gamma(n) = (n-1) !$	
λ	Lambda	Parameter used for Poisson distribution	$\lambda =$ Mean of Poisson distribution	Poisson distribution

Symbol	Text Equivalent	Meaning	Formula	Link to Glossary (if appropriate)
μ	Mu	Arithmetic mean or Average of the population.	$\mu = \frac{\sum x}{N}$ $\mu = E(x) = \sum xP(x)$	
μ_r	Mu-r	r th central moment	$\mu_r = E[(X - \mu)^r]$	Measures of central tendency.
μ'_r	Mu-r-dash	r th Raw moment	$\mu'_r = E(X^r)$	Measures of central tendency.
ρ	Rho	Population correlation coefficient	$\rho = \frac{Covariance(X, Y)}{SD(X) * SD(Y)}$	
Σ	Sigma	Summation	$\sum x =$ Sum of x scores.	
σ	Sigma	Population Standard Deviation	$\sigma = \sqrt{\frac{\sum (x - \mu)^2}{N}}$ $\sigma = \sqrt{E[(x - \mu)^2]} = \sqrt{\sum (x - \mu)^2 P(x)}$	Measures of dispersion
σ^2	Sigma square	Population variance	$\sigma^2 = \frac{\sum (x - \mu)^2}{N}$	Measures of dispersion

Mathematical Statistical Symbols:

Symbol	Text Equivalent	Meaning	Formula	Link to Glossary (if appropriate)
!	Factorial	Product of all integers up to the given number	$n! = n (n-1) (n-2) \dots 1.$ $0! = 1$	
c	Complement	not	For example: A^c is not A	
\cup	Union	or	For example: $(A \cup B)$ is happening of either event A or event B	

Symbol	Text Equivalent	Meaning	Formula	Link to Glossary (if appropriate)
\cap	Intersection	And	For example: $(A \cap B)$ is happening of both event A and event B	