

In a sample of 512 students, average marks are found to be 65 with standard deviation 12

Construct i) 94% C.I. for population Mean.

ii) 95% C.I. for population Mean.

iii) Confidence interval such that population mean will probably lie.

Solution:- Here, we have

Sample size(n) = 512
Sample Mean(\bar{X}) = 65
Sample SD(S) = 12
S.E.(\bar{x}) = $0.53033 = D10/SQRT(D8)$

For i) 94% Confidence interval for population mean

Here, C.I. (1- α) = 0.94
 α = 0.06 = 1-D14
 $Z_{\alpha} = 1.881 = NORMSINV(1-D15/2)$

Here, Lower limit = $64.0026 = D9 - D11 * D16$
Upper limit = $65.99744 = D9 + D11 * D16$

For ii) 95% Confidence interval for population mean

Here, C.I. (1- α) = 0.95
 α = 0.05 = 1-D23
 $Z_{\alpha} = 1.9600 = NORMSINV(1-D24/2)$

Here, Lower limit = $63.96057 = D9 - D11 * D25$
Upper limit = $65 = D9 + D11 * D26$

For iii) For probably lie, we should take

$Z_{\alpha} = 3$
Here, Lower limit = 63.40901
Upper limit = 66.59099

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	A	B	C	D	E	F	G	H	I
1	In a sample of 250 employees, average number of smoker found is 85.								
2	Construct	i)95% C.I. for Population proportion of smoker.							
3		ii) 90% C.I. for Population proportion.							
4		iii) confidence interval such that population proportion of smoker certainly lie.							
5									
6	Solution:-Here, we have								
7		Sample size(n) =	250						
8		No. of smoker(x)=	85						
9		Sample proportion (0.29297	=D8/D7					
10		S.E(x*) =	0.70703	=1-D9					
11	For i) 95% C.I. for Population mean								
12		Here, C.I.(1- a) =	95%						
13		a =	0.01	=1-D12					
14		Za =	2.57583	=NORM.S.INV(1-D13/2)					
15		Here,lower Limit =	73.1788	=D8-D10*D14					
16		Upper Limit =	76.8212	=D8+D10*D14					
17									
18	For ii) 90% C.I. for Population mean								
19		Here, C.I.(1- a) =	0.9						
20		a =	0.1	=1-D19					
21		Za =	1.64485	=NORM.S.INV(1-D20/2)					
22		Here,lower Limit =	83.837	=D8-D10*D21					
23		Upper Limit =	76.2378	=D8+D10*D21					
24									
25	For iii) For probably lie, we should take								
26		Za =	3						
27		Here,lower Limit =	72.8789	=D8-D10*C26					
28		Upper Limit =	77.1211	=D8+D10*C26					
29									
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31									

	A	B	C	D	E	F	G	H	I
1	A researcher wishes to estimate the average of an attribute by using sampling technique								
2	with 97% confidence and error not more than 3 If population SD is 25 Compute								
3	the appropriate sample size.								
4									
5	Solution:- Here, we have								
6			Confidence level($1-\alpha$)=			0.97			
7				α =		0.03	=1-F6		
8				$Z\alpha$ =		2.17009	=NORMSINV(1-F7/2)		
9			Max. Permissible error(E) =			3			
10			Population S.D (α) =			25			
11		Now,							
12			Required Sample size(n) =			327.0342	=(F8 * F10 / F9) ^ 2		
13									
14		Hence, the required sample size is 328.							
15									
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17									

	A	B	C	D	E	F	G	H	I
1	An observer wishes to estimate the population proportion of Ncell user by using sampling								
2	technique with error not more than 8%. If previous study shows that								
3	proportion of Ncell user was 20%. Compute the appropriate sample size								
4		i) If he wishes to be 95% confident.							
5		ii) If he wishes to be 99% confident.							
6		iii) If he wishes to be almost certain and information about pop.							
7		proportion is not given.							
8									
9	Solution:- Here, we have								
10		Max premissable error(E)=			0.08				
11			Pop. Prop(P)=		0.2				
12				Q=	0.8	=1-E11			
13		For (i) Here, C.I (1-α)=			0.95				
14				α=	0.05	=1-E13			
15				Zα=	1.9600	=NORMSINV(1-E14/2)			
16	Now, Required Sample size(n)=				96.03647	=(E15/E10)^2*E11*E12			
17		Hence, Required Sample size is 97.							
18		For ii) Here C.I(1-α)=			0.99				
19				α=	0.01	=1-E18			
20				Z=	2.575829	=NORMSINV(1-E19/2)			
21		Now, Required Sample Size(n)=			165.8724	=(E20/E10)^2*E11*E12			
22		Hence, Required Sample Size is 166.							
23		For iii) Here, for almost certain							
24				Zα=	3				
25	If value of P is not given, we use P=				0.5				
26				Q=	0.5				
27		Now, Required Sample size(n)=			351.5625	=(E24/E10)^2*E25*E26			
28		Hence, required sample size is 352.							
29									
30				Name:Parash Bista					
31									

	A	B	C	D	E	F	G	H	I
1	A sample of size 200 is drawn and mean is found to be 80. Test at 4% level of								
2	significance that whether it was drawn from a Population with mean 78 and SD								
3	15 or not.								
4									
5	Solution: Here , we have								
6		sample size(n)=	200						
7		Sample Mean(\bar{x})=	80						
8		Pop.Mean(μ)=	78						
9		Pop.SD(σ)=	15						
10	Here , we set up Hypothesis as								
11		$H_0 : \mu = 78$ i.e.	Sample us drawn from given population						
12		$H_1 : \mu \neq 78$ i.e.	Sample us drawn from given population						
13									
14	Under H_0	Test statistic							
15		S.E.(\bar{x})=	1.06066	=D9/SQRT(D6)					
16		Z_{cal} =	1.885618	=(D7-D8)/D15					
17	Level of sig.(α) =		0.04						
18		Z_{tab} =	2.053749	=NORMSINV(1-D17/2)					
19	Decision:- Since, $Z_{cal} < Z_{tab}$, we accept H_0 and reject H_1 with the								
20	conclusion that Sample is drawn from given population								
21									
22			Name: Parash Bista						
23									

	A	B	C	D	E	F	G	H	I
1	From the following information , state whether Company A is superior to								
2	comapany B or not.								
3		For company A				For company B			
4		n1=	64			n2=	100		
5		x^*_1	250			x^*_2	245		
6		S_1	20			S_2	15		
7									
8	Solution:- Here , we have								
9		For company A				For company B			
10		n1=	64			n2=	100		
11		x^*_1	250			x^*_2	245		
12		S_1	20			S_2	15		
13		Here, we set up Hypothesis as							
14		$H_0 : \mu_1 = \mu_2$ i.e.		There is no significant difference between two companies					
15		$H_1 : \mu_1 > \mu_2$ i.e.		Company A is Superior to Comapany B.					
16									
17	Under H_0	Test statistic							
18		S.E.(x^*)=		2.915476	$=\text{SQRT}(C12^2/C10+G12^2/G10)$				
19		Z_{cal} =		1.7150	$=(C11-G11)/D18$				
20	Level of sig.(α) =			0.05					
21		Z_{tab} =		1.645	$=\text{NORMSINV}(1-D20)$				
22	Decision:- Since, $Z_{cal} > Z_{tab}$, we reject H_0 and accept H_1 with the								
23	conclusion that Company A is Superoir to Company B.								
24									
25				Name : Parash Bista					
26									

	A	B	C	D	E	F	G	H	I
1	A dice is rolled 1024 times and face six is observed 160 times. Test at 7% of significance,								
2	whether the dice is unbiased or not.								
3									
4	Solution :- Here , we have								
5		Sample size(n)=		1024					
6		No of Six faces (x)=		160					
7		Sample prop.(p)=		0.15625	=D6/D5				
8		Pop.Prop(P) =		0.166667					
9			Q=	0.833333					
10		Here, we set up Hypothesis as							
11		H0 : P = 1/6 i.e.			Dice is unbiased				
12		H1 : P ≠ 1/6 i.e.			Dice is biased				
13		Under H ₀	Test statistic						
14			S.E.(x*)=	0.011646	=SQRT(D8*D9/D5)				
15			Z _{cal} =	-0.89443	=(D7-D8)/D14				
16			Z _{cal} =	0.894427	=ABS(D15)				
17		Level of sig.(α) =		0.07	0.05				
18			Z _{tab} =	1.811911	=NORMSINV(1-D17/2)				
19		Decision:- Since,Zcal < Ztab , we accept H ₀ and reject H ₁ with the							
20		conclusion that Dice is Unbiased							
21									
22			Name: Parash Bista						
23									

	A	B	C	D	E	F	G	H	I
1	From the followeing information, state whetheer City A is more literate than								
2	City B or not. Test at 92% Confidence Level.								
3				For City A				For City B	
4		No. of Person		$n_1 =$	1000			$n_2 =$	800
5		No. of Literate		$x_1 =$	600			$x_2 =$	500
6									
7	Solution:- Here, we have								
8				For City A				For City B	
9		No. of Person		$n_1 =$	1000			$n_2 =$	800
10		No. of Literate		$x^*_1 =$	600			$x_2 =$	500
11				$p_1 =$	0.6			$p_2 =$	0.625
12	Combined Prop. (P) =			0.611111					
13			Q =	0.388889					
14	Here, we set up Hypothesis as								
15	$H_0 : P_1=P_2$ i.e. There is no significant difference in literacy rate of 2 cities								
16	$H_1 : P_1>P_2$ i.e. City A has more literacy rate than City B.								
17									
18	Under H_0 , Test Statistic								
19		S.E. (p_1-p_2) =		0.023124					
20			Zcal. =	-1.08112					
21			Zcal. =	1.081125					
22		C.I. ($1 - \alpha$) =		0.92					
23		Level of Sig. (α)		0.08					
24	For one tailed test,								
25			Ztab. =	1.405072					
26	Decision :- Since, Zcal. < Z tab., we accept H_0 and eject h_1 with the								
27	conclusion that City A has more literacy rate than City B								
28									
29				Name: Parash Bista					
30									

	A	B	C	D	E	F	G	H	I	J
1	From the given data of daily expenditure below, test whether the average expenditure									
2	of a family is 1500 per day at 90% confidence level.									
3	1250	1400	1850	2000	2200	1750	1950	1900	1200	1000
4										
5	Solution :- Here, we have									
6	1250	1400	1850	2000	2200	1750	1950	1900	1200	1000
7		Sample size (n) =		10	=COUNT(A3:J3)					
8		Pop. Mean (μ) =		1500						
9	Sample Mean (\bar{X}) =			1650	=AVERAGE(A6:J6)					
10		Sample SD(S) =		404.83	=STDEV.S(A6:J6)					
11	$H_0: \mu \neq 1500$ i.e Av. Exp. Of a family is Rs. 1500									
12	$H_1: \mu \neq 1500$ i.e Av. Exp. Of a family is other than Rs. 1500									
13										
14										
15			S.E.(\bar{x})	128.02	=D10/SQRT(D7)					
16			$t_{cal} =$	1.1717	=(D9-D8)/D15					
17			CI (1- α)	0.9						
18			$\alpha =$	0.1	=1-D17					
19			d.f =	9	=D7-1					
20			$t_{tab} =$							
21			$t_{tab} =$	1.6449	=NORMSINV(1-D18/2)					
22	Decision :- Since, $t_{cal} < t_{tab}$, we accept H_0 , and reject H_1 , with the									
23	conclusion that Av. Exp. of a family is Rs. 1500.									
24										
25			Name: Parash Bista							
26										
27										

	A	B	C	D	E	F	G	H	I	J
1	From the data of marks of studens in a test given below, test whether the average marks									
2	of a students is atleast 60 or not at 95% confidence level.									
3	55	65	60	62	63	45	70	75	70	65
4										
5	Solution:- Here, we have									
6	55	65	60	62	63	45	70	75	70	65
7		Sample size (n)=		10	=COUNT(A3:J3)					
8		Popn. Mean(μ)=		60						
9		Sample Mean (\bar{x})=		63	=AVERAGE(A6:J6)					
10		Sample SD (S)=		8.4853	=STDEV.S(A6:J6)					
11		Here, we set up Hypothesis as								
12		$H_0 : \mu = 60$ i.e. Av. Marks of a student is Rs. 60.								
13		$H_1 : \mu > 60$ i.e. Av. Marks of a student is more than Rs. 60.								
14										
15			S.E.(\bar{x})	2.6833	=D10/SQRT(D7)					
16			t_{cal} =	1.118	=(D9-D8)/D15					
17			C.I.(1- α)	0.95						
18			α =	0.05	=1-D17					
19			d.f=	9	=D7-1					
20			t_{tab} =	2.2622	=T.INV.2T(D18,D19)					
21	Decision :- Since, $t_{cal} < t_{tab}$, we accept H_0 and reject H_1 with the									
22	conclusion that Av. Marks of a student is more than 60.									
23										
24				Name: Parash Bista						
25										