In a sanple of 512 students , average marks is found to be 65 with standard deviation 12
Construct i) 94% C.I for population Mean.
ii) 95% C.I. fir population Mean.
iii)Confidence interval such that population mean will probably lie.

Solution:- Here, we have

Sample size(n) =	512	
Saample Mean(X*) =	65	
Sample SD(S) =	12	
S.E.(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
Zα=	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
Zα=	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

Zα=	3	
Here, Lower limit =	63.40901	
Upper limit =	66.59099	

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In a sample of 250 employees, average number of smoker found is 85.
Construct i)95% C.I. for Population proportion of smoker.
ii) 90% C.I. for Population proportion.
iii) confidence interval such that population proportion of smoker certainly lie.

Solution:-Here, we have

Sample size(n) =	250	
No. of smoker(x)=	85	
Sample proportion (	0.29297	=D8/D7
S.E(x*) =	0.70703	=1-D9

For i) 95% C.I. for Population mean

Here, C.I.(1- a) =	95%	
a =	0.01	=1-D12
Za =	2.57583	=NORM.S.INV(1-D13/2)
Here,lower Limit =	73.1788	=D8-D10*D14
Upper Limit =	76.8212	=D8+D10*D14

For ii) 90% C.I. for Population mean

Here, C.I.(1- a) =	0.9	
a =	0.1	=1-D19
Za =	1.64485	=NORM.S.INV(1-D20/2)
Here,lower Limit =	83.837	=D8-D10*D21
Upper Limit =	76.2378	=D8+D10*D21

For iii) For probably lie, we should take

Za =	3	
Here,lower Limit =	72.8789	=D8-D10*C26
Upper Limit =	77.1211	=D8+D10*C26

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	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-α)=			0.97			
7				α =		0.03	=1-F6		
8				Zα =		2.17009	=NORMSINV(1-F7/2)		
9			Max. Permissable 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									
16				Name: Parash Bista					
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(x*)=		80					
8		Pop.Mean(μ)=		78					
9		Pop.SD(σ)=		15					
10		Here , we set up Hypothesis as							
11		H0 : μ = 78 i.e.		Sample us drawn from given population					
12		H1 : μ ≠ 78 i.e.		Sample us drawn from given population					
13									
14	Under H_0	Test statistic							
15		S.E.(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,Zcal < Ztab , 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		H0 : μ1 = μ2 i.e.		There is no significant difference between two companies					
15		H1 : μ1>μ2 i.e.		Company A is Superior to Comapany B.					
16									
17	Under H_0	Test statistic							
18		S.E.(x*)=		2.915476	=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	=NORMSINV(1-D20)				
22		Decision:- Since,Zcal > Ztab , 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 ≠ 1/6i.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 Unbaised						
21									
22				Name: Parash Bista					
23									

	A	B	C	D	E	F	G	H	I
1	From the followeing information, state whetheher 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				p1 =	0.6			p2 =	0.625
12	Combined Prop. (P) =			0.611111					
13			Q =	0.388889					
14		Here, we set up Hypothesis as							
15		H0 : P1=P2 i.e.There is no significant difference in literacy rate of 2 cities							
16		H1 : P1>P2 i.e. City A has more literacy rate than City B.							
17									
18	Under H0, Test Statistic								
19		S.E. (p1-p2) =		0.023124					
20			Zcal. =	-1.08112					
21			Zcal. =	1.081125					
22		C.I. (1 - α) =		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 H0 and eject h1 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 expendeture below, test weather 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 (X*) =			1650	=AVERAGE(A6:J6)					
10		Sample SD(S) =		404.83	=STDEV.S(A6:J6)					
11		H_0: μ ≠ 1500 i.e Av. Exp. Of a family is Rs. 1500								
12		H_1: μ ≠ 1500 i.e Av. Exp. Of a family is other than Rs. 1500								
13										
14										
15			S.E.(x*)	128.02	=D10/SQRT(D7)					
16			t_{cal} =	1.1717	=(D9-D8)/D15					
17			CI (1-α)	0.9						
18			α =	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, tcal < ttab, we accept H0, and reject H1, 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 (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 : μ = 60 i.e. Av. Marks of a student is Rs. 60.								
13		H_1 : μ > 60 i.e. Av. Marks of a student is more than Rs. 60.								
14										
15			S.E.(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										

	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 ≠ 1/6i.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 Unbaised						
21									
22				Name: Parash Bista					
23									