

Statistical Inferences Made Easy with Excel

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- When I am not working on my classes or serving at my local church I enjoy:
 - Coffee
 - Jogging
 - Sudoku
 - Family
 - Football (Dallas Cowboys)
 - Not necessarily in that order



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This presentation will demonstrate how I use Excel to facilitate my students' understanding of

statistical inferences.

That is, with minimal inputs, my students can:

- (A) Calculate Probability Measures: for sampling distributions,
- (B) Calculate Confidence Intervals for Population Means and Population Proportions,
- (C) Calculate the P-Value for an Hypothesis test. Hence, easier Statistical Inference.



• This presentation will demonstrate how I use Excel to facilitate my students' understanding of statistical inferences. • That is, with minimal inputs, my students can:

•Calculate Probability Measures: for Sampling Distributions,



This Spreadsheet Simplifies Analyses as follows:

- (1) Provides an immediate display of the Empirical Rule: Given Mean and SD
- (2) Calculates Probability for Sampling Distribution for n>1
 (3) Calculates Probability for Population Normal, when n=1
 (4) Provides Standard Error
- (5) Probability between "a" and "b"
- (6)Probability to the left or right of "a"



• Calculate Confidence Intervals for Population Means and Population Proportions,

μ				
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This Spreadsheet Simplifies Analyses as follows:

- (1)Only Three Inputs needed,
- (2)Gives the Confidence Interval for the three commonly requested cases,

(3)Provides Immediateaccess to theStandard Error (quitea busy Calculation)

CONTIGENCE Interval_Proportion					
Level of Confidence	90%	95%	99%		
Sample n=	3894	3894	3894		
Χ	2853	2853	2853		
P^=x/n	0.7327	0.733	0.7327		
success: n*P=	2853	2853	2853		
Failure: n*(1-P)=	1041	1041	1041		
Z=	1.6449	1.96	2.5758		
SE=SD_of_P^	0.0071	0.0071	0.0071		
Confidence Interval: P^±Z*SE					
LB=	0.721	0.719	0.714		
UB=	0.744	0.747	0.751		

ONLY INPUT in Yellow

Confidence Population Mean: μ

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Level of Confidence	90%	90%	95%	99%	
Sample n=	80	80	80	80	
\overline{X}	69.00	69	69 69		
S	4.00	4	4	4	
(a) Requires Sample ≥ 30	Yes	Yes	Yes	Yes	
(b) Population Distribution	NA	NA	NA	NA	
T _c =	1.66437	1.66437	1.99045	2.63950	
$\frac{S}{\sqrt{n}}$ = Standard Error:SD_of \overline{X}	0.44721	0.44721	0.44721	0.44721	
$LB = \overline{X} - Tc * \frac{S}{\sqrt{n}}$	<mark>68.2557</mark>	68.2557	68.1098	67.8196	
UB = $\overline{X} + Tc * \frac{S}{\sqrt{n}}$	<mark>6</mark> 9.7443	69.7443	69.8902	70.1804	
Margin of Error	0.744	0.744	0.890	1.180	
Point Estimate:	69	69	69	69	







Calculate the P-Value for Hypothesis test. Hence, easier Statistical Inference. This Spreadsheet Simplifies Analyses as follows:

(1) Calculates: T-Value
(2) Calculates: P-Value
(3)Provides Decision
Rule based on the
P-Value

Hypothesis Test Mean (Right Tail)					
Only Input in Yellow					
$\overline{X} = X_Bar$	18.5				
N=n	35				
لو (From Null Hypothesis)	20				
S	4.3				
$SE = \frac{S}{\sqrt{n}}$	0.726832659				
$T = \frac{\bar{X} - \mu}{\frac{S}{\sqrt{n}}}$	-2.0637				
p - $Value = P(\overline{X} \ge x \mu = uo) = T.DIST.RT(x,n-1)$					
P-Value=	0.9766				
ALPHA= α	0.0500				
f P-Value < α (Reject Ho)	Do not reject Ho	=Decision"			

Enjoy the Super Bowl Eagles vs Chiefs



Next Year the



Enjoy your Day