

Information Technology CS编程辅导

FIT1006 Business Fraction Analysis

WeChat: cstutorcs

Assignment Project Exam Help

Lecture 16 Estimation

Email: tutorcs@163.com

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https://tutorcs.com

Topics covered: 代写代做 CS编程辅导

- Small sample
- The t-Distribu
 - which adjubis Char: Cstuwhen s is estimated from the data by s and corrects for small samples.
- Setting the sample size for a required level of accuracy.

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Motivating Pfoblem代做 CS编程辅导

- The Australian Newspoll had the two-party preferred vote at Labor 151% Liberal-NP 49% from a sample of an about 160 people chosen at random.

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- Hint: Find a 95% Cl for the expected Liberal-NP vote.
- https://tutorcs.com Ref: http://www.theaustralian.com.au/national-affairs/newspoll



Are you 95% confidence that Labor would win?

- Find a 95% CI f
- p = 0.51, n = 1,160. WeChat: cstutorcs
- The 95% CI is:

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$$\pi = p \pm 1.96 \sigma_{\text{mil}}$$
; $\sigma_{\text{thtores}} = \frac{p(1-p)}{2000}$.com

$$\pi = 0.51 \pm QQ674953894976 = 0.51 \pm 0.029$$

- LCL (Lower Confidence Lamber 1976) 1 0.029 = 0.481
- UCL (Upper Confidence Limit) = 0.51 + 0.029 = 0.539



Small Samples^{序代写代做 CS}编程辅导

- One of the functions all assumptions of the Central Limit Title is that of large sample sizes are used
- 'Large' means at least 30 th practice.
- When sample sizes are small entered Walkance of the population punknown the Normal distribution cannot be used as the basis of a confidence interval.
- Instead the t-Distribution's comed.

Student's t-D存储的CS编程辅导

- The t-Distribution derived by W. S. Gosset, a scientist working the Guinness brewery. He published under the pseudonym 'student.' As a consequence the distribution project Exam Help
- The t-Distribution has the equation of the tension o
- The t distribution is (heavy-tailed) for small values https://tutorcs.com of n. As n increases, the shape of the t-Distribution becomes closer to the Normal distribution.

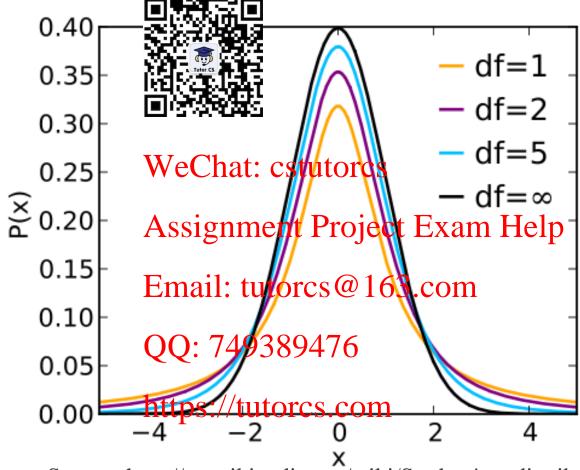


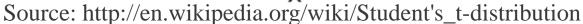
Degrees of F程序位写代做 CS编程辅导

- The number of the state of freedom or v, refers to the number of characteristics that are free to vary when determining the variance or standard error of a sample.

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- The general rule for calculating the number of degrees of freedom is to count the number of observations artificial that is derived from the sample 76
- In practice, for one-sample problems, v equals the number of observations less 1 (because we use the *derived* sample mean).

Comparison 智行為原体 CS编程辅导







Tables for the 在 Distribution.

• On Excel 12 2 2 3 DIST.XLS

Critical Valu	ies of the t D	istri buti 🙀	Tutor CS	į				
		મિંદ						
Table gives (upper critica	l values 🔳						
				а				
n	0.300	0.200	0.150	0.100	0.050	0.025	0.010	0.005
1	0.7265	1.3764	edigese.	CSTPHA	CS _{6.3138}	12.7062	31.8205	63.6567
2	0.6172	1.0607	1.3862	1.8856	2.9200	4.3027	6.9646	9.9248
3	0.5844	0.9785	cci 67498	ent.P77	16 2 £ 5 B 4	(2131 <mark>82</mark> 4	4.5407	5.8409
4	0.5686	0.9410	7.1896	1.5332	2.1318	2.7764	3.7469	4.6041
5	0.5594	0.9195	1,1558	1.4759	2.0150	2.5706	3.3649	4.0321
6	0.5534	0.9057	maili34a	itorase	0 1 (1.94.20)	D M 2.4469	3.1427	3.7074
7	0.5491	0.8960	1.1192	1.4149	1.8946	2.3646	2.9980	3.4995
8	0.5459	0.88 <mark>89</mark>	1 , 1084	2 003968	1.8595	2.3060	2.8965	3.3554
9	0.5435	0.8834	1.0997	1.3830	1.8331	2.2622	2.8214	3.2498
10	0.5415	0.8791	1.0931	1.3722	1.8125	2.2281	2.7638	3.1693
11	0.5399	0.87	toszøgtu	torc363@	0111 .7959	2.2010	2.7181	3.1058
12	0.5386	0.8726	1.0832	1.3562	1.7823	2.1788	2.6810	3.0545
13	0.5375	0.8702	1.0795	1.3502	1.7709	2.1604	2.6503	3.0123
14	0.5366	0.8681	1.0763	1.3450	1.7613	2.1448	2.6245	2.9768
15	0.5357	0.8662	1.0735	1.3406	1.7531	2.1314	2.6025	2.9467

Upper critica程序就是代做 CS编程辅导

					=
n	0.300	0.200	الا	MANAGEL	_
1	0.7265	1.3764	1.	254	ø
2	0.6172	1.0607	1. 45.		-1
3	0.5844	0.9785	1.	Tutor CS	Ā
4	0.5686	0.9410	<u>1.</u> 代刊		ŁΤ
5	0.5594	0.9195	1. ■		S
6	0.5534	0.9057	1.1342	1.4398	
7	0.5491	0.8960	1.1192	1.4149	
8	0.5459	0.8889	1.1077	1.1968	۱.
9	0.5435	0.8834	1.0997	1.3830	٠.
10	0.5415	0.8791	1.0931	1.3722	

Upper critical value is based on upper region.

If you're looking for a 80% confidence level, then $\alpha = 1 - 0.8 = 0.2$

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Assignment Project Exam $He^{\frac{1.0931}{2}}$ = 0.1

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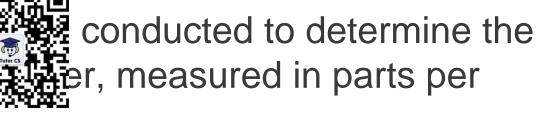


If your sample size is 5, $t_{(4,0.1)} = t_{(4,0.1)} = t_{(4,0.1)} = t_{(4,0.1)}$

Example 1

程序代写代做 CS编程辅导

Five experimens amount of silical million (ppm).



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Assignment Project Exam Help
 Data: 229, 255, 280, 203, 229.

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Estimate the mean amount of silica using a 99% confidence interver: https://tutorcs.com



https://flux.qa 作色的优做 CS编程辅导

0.01/2 = 0.005

Question 1

t_{α/2}=? Leand a 99% confidence

For a sample single and a 99% confidence interval, the corporation of the statistic is: v = 5-1 = 4

A. 3.7469 WeChat: Btut4r6041

C. 3.3649 Assignment Project Exam Help

n	0.300	0.200	0.150			0.025	0.010	0.005
1	0.7265	1.376	ma <u>l</u> 962t	utorgs/	<u>w 1 53436</u>	<mark>O∰</mark> .7062	31.8205	63.6567
2	0.6172	1.0607	1.3862	1.8856	2.9200	4.3027	6.9646	9.9248
3	0.5844	0.978	1.274980	2 2105377	6 2.3534	3.1824	4.5407	5.8409
4	0.5686	0.9410	1.1896	1.5332	2.1318	2.7764	3.7469	4.6041
5	0.5594	0.9195	1.1558	1.4759	2.0150	2.5706	3.3649	4.0321
6	0.5534	0.905	ttps184ti	utores a	OM 9432	2.4469	3.1427	3.7074
7	0.5491	0.8960	1.1192	1.4149	1.8946	2.3646	2.9980	3.4995
8	0.5459	0.8889	1.1081	1.3968	1.8595	2.3060	2.8965	3.3554
9	0.5435	0.8834	1.0997	1.3830	1.8331	2.2622	2.8214	3.2498
10	0.5415	0.8791	1.0931	1.3722	1.8125	2.2281	2.7638	3.1693
	1 2 3 4 5 6 7 8	1 0.7265 2 0.6172 3 0.5844 4 0.5686 5 0.5594 6 0.5534 7 0.5491 8 0.5459 9 0.5435	1 0.7265 1.376 2 0.6172 1.0607 3 0.5844 0.978 4 0.5686 0.9410 5 0.5594 0.9195 6 0.5534 0.905 7 0.5491 0.8960 8 0.5459 0.8889 9 0.5435 0.8834	1 0.7265 1.376 Malect 2 0.6172 1.0607 1.3862 3 0.5844 0.978 1.2498 4 0.5686 0.9410 1.1896 5 0.5594 0.9195 1.1558 6 0.5534 0.905 1.192 7 0.5491 0.8960 1.1192 8 0.5459 0.8889 1.1081 9 0.5435 0.8834 1.0997	1 0.7265 1.376 Mabe 2d Utos (757) 2 0.6172 1.0607 1.3862 1.8856 3 0.5844 0.9786 0.2410 1.27498 3 816377 4 0.5686 0.9410 1.1896 1.5332 5 0.5594 0.9195 1.1558 1.4759 6 0.5534 0.9057 ttps13/42 tto1.4398 7 0.5491 0.8960 1.1192 1.4149 8 0.5459 0.8889 1.1081 1.3968 9 0.5435 0.8834 1.0997 1.3830	1 0.7265 1.3764 Male 2d Uto 1.6787 1.338 2 0.6172 1.0607 1.3862 1.8856 2.9200 3 0.5844 0.9786 1.27980 3.80377 2.3534 4 0.5686 0.9410 1.1896 1.5332 2.1318 5 0.5594 0.9195 1.1558 1.4759 2.0150 6 0.5534 0.9057 1.192 1.4149 1.8946 8 0.5459 0.8889 1.1081 1.3968 1.8595 9 0.5435 0.8834 1.0997 1.3830 1.8331	1 0.7265 1.376 1.3862 1.0607 1.3862 1.8856 2.9200 4.3027 3 0.5844 0.9785 1.24980 3.849377 2.3534 3.1824 4 0.5686 0.9410 1.1896 1.5332 2.1318 2.7764 5 0.5594 0.9195 1.1558 1.4759 2.0150 2.5706 6 0.5534 0.9057 1.1981 1.101 1.398 011 9432 2.4469 7 0.5491 0.8960 1.1192 1.4149 1.8946 2.3646 8 0.5459 0.8889 1.1081 1.3968 1.8595 2.3060 9 0.5435 0.8834 1.0997 1.3830 1.8331 2.2622	1 0.7265 1.376 Malega Utology 0.57 1.313 0M1.7062 31.8205 2 0.6172 1.0607 1.3862 1.8856 2.9200 4.3027 6.9646 3 0.5844 0.9786 1.27980 3.816377 6 2.3534 3.1824 4.5407 4 0.5686 0.9410 1.1896 1.5332 2.1318 2.7764 3.7469 5 0.5594 0.9195 1.1558 1.4759 2.0150 2.5706 3.3649 6 0.5534 0.9057 1.1558 1.4759 2.0150 2.5706 3.3649 7 0.5491 0.8960 1.1192 1.4149 1.8946 2.3646 2.9980 8 0.5459 0.8889 1.1081 1.3968 1.8595 2.3060 2.8965 9 0.5435 0.8834 1.0997 1.3830 1.8331 2.2622 2.8214

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Solution

程序代写版做 CS编程辅导

Data: 229, 255, 280, 203, 229

$$\bar{x} = 239.2 \text{ and } s = 2$$

and the mean and std ev. from these values.

$$\alpha = (1 - \text{confidence})$$

$$\alpha = (1 - \text{confidence} - (1 - 0.99) = 0.01, \text{ Thus } \frac{\alpha}{2} = 0.005.$$

The sample size is 5 When bet De Fitto is 4.

From tables of the tadistribution tailer tailer Examples

A 99% CI for
$$\mu$$
 is $\mu = \frac{\text{Email: } t_{\alpha}}{\sqrt{n}}$. Para 163.com QQ: 749389476

Thus a 99% CI is $\mu = \frac{29.3}{\sqrt{5}}$.

Thus a 99% CI is
$$\mu_{\overline{1}\overline{1}\overline{1}\overline{2}\overline{3}\overline{3}\overline{9}/\overline{2}\overline{1}\overline{1}\overline{4}\overline{4}\overline{6}\overline{9}\overline{6}\overline{9}\overline{1}\overline{5}$$
.

i.e. $\mu = 239.2 \pm 60.3$ ppm at the 99% confidence level.



Confidence Iftervals 的 SYSTAT

The descriptive smenu in SYSTAT determines 95% confidences so by default, but can be set to any value. Using the set to the previous question.

SILICA	WeChat:	SILI	CA_PPM
N of cases	5	N of cases	5
Minimum	20 Assignme	nt ProjectuExam	Help.000
Maximum	²⁸ Email: tu	orcs@163.com	280.000
Mean	239.200	Mean	239.200
95% CI Upper	275.575	394<mark>76</mark> 99% CI Uppe:	r 299.519
95% CI Lower	2 dattps:5//tut	rcs.20mCI Lowe:	r 178.881
Standard Dev	29.295	Standard De	v 29.295



程序代写代做 CS编程辅导 Example 2

wing numbers of shoppers over A shop reported two weeks. Calc 5% confidence interval for the average number

126C156 132 31 122 126 123 150 Data: 160 67

Descriptive statistics are: Assignment Project Exam Help

Email: tu	torcs@1849.PPERS							
00 740	N of cases	14						
QQ: 7493	894./6 Minimum	31.000						
https://tut	Mesicom	179.000						
	Mean	124.286						
	Standard Dev	39.169						



https://flux.qa推序eed coodes编键解写V)

Question 2

For a sample six 4, and a 95% confidence interval, the corbination of the statistic is:

A. 1.7709

WeChat: Stutorc 904

 $\alpha/2 =$

0.05/2

C. 1.7613

Assignment Project Exam Help = 0.025

n	0.300	0.200	0.150	0.100	0,050	0.025	0.010	0.005
8	0.5459	0.888	mah ₀₈₁	West of the state	<u>@∏o</u> sses	OM _{2.3060}	2.8965	3.3554
9	0.5435	0.8834	1.0997	1.3830	1.8331	2.2622	2.8214	3.2498
10	0.5415	0.879	1.0931) 2 Q1G7P7	6 1.8125	2.2281	2.7638	3.1693
11	0.5399	0.8755	1.0877	1.3634	1.7959	2.2010	2.7181	3.1058
12	0.5386	0.8726	1.0832	1.3562	1.7823	2.1788	2.6810	3.0545
13	0.5375	0.8702	ttpson/eti	itoresax	COM 7709	2.1604	2.6503	3.0123
14	0.5366	0.8681	1.0763	1.3450	1.7613	2.1448	2.6245	2.9768
15	0.5357	0.8662	1.0735	1.3406	1.7531	2.1314	2.6025	2.9467
16	0.5350	0.8647	1.0711	1.3368	1.7459	2.1199	2.5835	2.9208
17	0.5344	0.8633	1.0690	1.3334	1.7396	2.1098	2.5669	2.8982

SHOPPERS

14 N of cases

Solution

程序代写代做 CD编辑辅导

31.000

Maximum 179.000

124,286 Mean

Standard Dev 39.169

From the data : $\bar{x} =$

$$\sigma_{\bar{x}} = 10.5, \quad t_{0.025(13)}$$

$$t_{0.025(13)} = 2.160$$

$$95\% C.I. = 124.3 \pm 2.160 \times 10.5$$

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of **QQ**e**\$**49389476¹⁴

95% CI Upper 146.901 https://tutorcs.com 95% CI Lower 101.670



Pooled Samples 与的性。S编辑编句s

The usual way



alate the standard error

• For the difference of means is: $\sigma_{\overline{x}_1 - \overline{x}_2} = \sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}$

Assignment Project Exam Help

- However, when waih avertwo 15 malh samples of similar variance it is possible to calculate the variance of the 'pooled' sample which gives a smaller standar of the first of the sample which gives a
- See following slide.

Pooled Samples — C.I. Calculations

We can determine a continuous interval for the difference of population means for small sample. The variance of the pooled sample.

Suppose we have \bar{x}_1 and \bar{x}_2 , s_1^2 and s_2^2 we wish to find a C.I. for $\mu_1 - \mu_2$. We assume both population that the same variance and make an estimate of the population standard deviation with the formula Help

$$s = \sqrt{\frac{(n_1 - 1)s_1^2 + (n_2 E_1)s_2^2}{n_1 + n_2 - 2}}$$
 in the solution of the solution o

We use the t distribution with degrees of freedom $v = n_1 + n_2 - 2$.

Our $(1-\alpha)$ confidence interval is given by $(\bar{x}_1 - \bar{x}_2) \pm t_{\alpha/2} s_{\bar{x}_1 - \bar{x}_2}$



Pooled Samples 与此格的 # 导

measured over a **Cartes** (different) days.



The number of classes essed by two workers is

• Worker A: 23, 45, 21, 22, 17, 42, 45, 41, 49, 19. Assignment Project Exam Help

Worker B: 33, 23, 49, 25, 10, 10, 10, 10, 10, 10

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 Calculate a 95% Chitpsorttherelifterence in the average number of claims (A-B) processed by the workers.

Pooled Samples¹⁵Summary Stats

			_
	orker A	Worker B	
Tutor CS	23	33	
INDIVIDUAL DE	1 45	23	
EDITO ARADA	21	19	
WoCho	t: cstuţo	51 CS	
WCCIIa	1. CStuto 17	32	
Assign	ment P42	ject Exa	m Help
Email:	tutores 49	1 63.con	n
QQ: 74	9389476		
Nottne //	10.00	6.00	
Mean Mean	32.40	28.83	
St Dev	12.92	12.97	



Population standard deviation, $s = \sqrt{\frac{(n_1 - 1)s_1^2 + (n_2 - 1)s_2^2}{n_1 + n_2 - 2}}$

Pooled Samples 代码领域 CS编编

From the data:

se the t distribution with degrees of freedom
$$v = n_1 + n_2 - 2$$
.

11- α) confidence interval is given by $(\bar{x}_1 - \bar{x}_2) \pm t_{\alpha/2} s_{\bar{x}_1 - \bar{x}_2}$

$$\bar{x}_1 = 32.40, \quad s_1 = 12$$

$$s = \sqrt{\frac{9 \times 12.92^2 + 5 \times 12.97^2}{14}}$$

$$s_{\bar{x}_1 - \bar{x}_2} = 12.94 \sqrt{\frac{1}{10} + \frac{1}{10} + \frac{1}{10}} = 12.94 \sqrt{\frac{1}{10} + \frac{1}{10} + \frac{1}{10}} = 12.94 \sqrt{\frac{1}{10} + \frac{1}{10}} = 12.94 \sqrt{\frac{1}{10}} = 12.94 \sqrt{\frac{1}{10}} = 12.94 \sqrt{\frac{1}{10}} = 12.94 \sqrt{\frac{1}{10}}$$

$$t_{(0.025,14)} = 2.147$$

QQ:
$$749389476$$

95% $C.I. = (32.40 - 28.83) \pm 2.147 \times 6.68 = 3.57 \pm 14.34$

$$=(-10.78, 17.91)$$
 https://tutorcs.com

Variable	 -	N	Mean	
WORKERA WORKERB	1	10.000 6.000	2.400 8.833	Tutor CS

Separate Variance

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	!	95.00% Confidence Interval							
Variable	Mean	Difference A_{SS}	signment	Project Exa	m He	lp df	p-Value		
WORKERA	-+ ¦		-11.214			- <u>-</u>	0.605		
WORKERB	1	Em	ail· tutoro	cs@163.cor	n				

Pooled Variance

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Variable	 Mean	Difference http	5.00% Confidence Swerttling FCS.	Interval	t	df	p-Value
WORKERA WORKERB	 ! !	3.567	-10.762	17.896	0.534	14.000	0.602



https://flux.qa推序eed coodes编线系V)

Question 3

To reduce the value population meals



a confidence interval of a hecessary to: (best answer)

- A. Increase sample size tutorcs
- B. Decrease sample size Project Exam Help
- C. Increase confidence level 163.com
- D. Increase significance D. Increase significance
- ✓ E. (A or D)
- https://tutorcs.com

F. (B or C)



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Factors Affecting Sample Size

- ***nce required, 99, 95, 90% etc. The degree of
- The number of degrees of freedom for small samples. WeChat: cstutorcs
- The standard error of the estimate.

 Assignment Project Exam Help

 Degrees of Freedom increases and Standard Error
- diminish as santiphaisizetince \$63.com
- For n > 30, the walues of the Distribution are close enough to the Normal distribution and so we must adjust sample sixtesto/further.ceduce standard error.



Choosing a Sample Size 编程辅导



Thus, $Z_{\alpha/2}s_{\bar{x}}$ is half the width of the confidence interval.

Suppose we want to ensure that the half width is less than a

desired value, E. We want $Z_{corr} s_{\bar{c}s} \in E$ But $s_{\bar{b}} = s / \sqrt{n}$.

We want a value of Queuth 9th 80 $\frac{Z_{\alpha/2}S}{\sqrt{n}} \le E$, that is, $n \ge \left(\frac{Z_{\alpha/2}S}{E}\right)^2$.

https://tutorcs.com $Z_{\alpha/2} s_x$

FIT1006 Business Information Analysis - Lecture 16 annotated

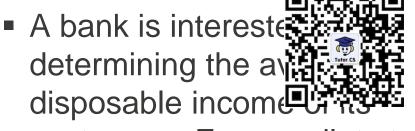


\Z _{α/2}

Example 4

程序代写代做。GS编程辅导

Using a one sided calculation:



they estimate the standard

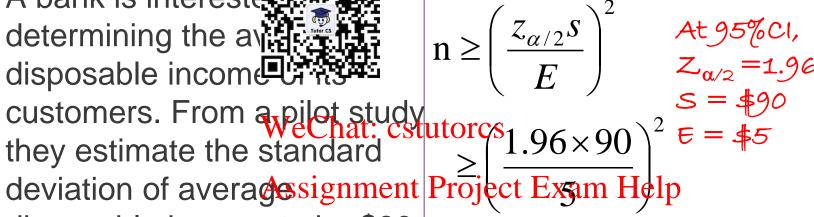
deviation of averagesignment Project Exam Help

disposable income to be \$90. How many customers should n > 1244 6

they sample if the war 1450389476

obtain an accuracy of \$5 at https://tutorcs.com

the 95% level?



$$n \ge 1244.6 \ or \ 1245$$

$$\frac{\overline{x}}{\$5} \qquad \frac{\overline{x}}{\$5}$$

What You Should Know S编程辅导

You should have state a of degrees of freedom and be able to read the tall the t

You should be able to calculate a confidence interval for the population mean based noneatamoile at a male. Help

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 You should be able to salculate the required sample size for a given confidence interval.

https://tutorcs.com



Reading/Questions (Selvanathan)

Reading: Estimatical



- Questions: Estimation WeChat: cstutorcs
 - 7th Ed. Questions and Data 10.40, 10.46, 10.53, 10.56, 10.72, 10.76, 10.77.

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