

 Shoe and Apparel E-Tailers. In the special report "Mousetrap: The Most-Visited Shoe and Apparel Etailers" (Footwear News, Vol. 58, No. 3, p. 18), we found the following data on the average time, in minutes, spent per user per month from January to June of one year for a sample of 15 shoe and apparel retail websites.

13.3 9.0 11.1 9.1 8.4 15.6 8.1 8.3 13.0 17.1 16.3 13.5 8.0 15.1 5.8

Estimate the mean time spent on site with a 95% Confidence Interval.



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t-Interval

Which PROCEDURE?

5. Independent random samples of 15 midwestern households and 14 southern households provided the following data on last year's vehicle miles of travel in thousands of miles. At the 5% significance level, does there appear to be a difference in last year's mean vehicle miles traveled for midwestern and southern households? (Assume normal distribution.)

	MIDWEST			SOUTH	
16.2	10.8	20.3	22.2	15.8	17.5
12.9	11.2	20.9	19.2	18	18.2
17.3	16.6	9.6	9.3	12.2	22.8
14.6	16.6	15.1	24.6	20.1	11.5
18.6	24.4	18.3	20.2	16	
mean		16.23			17.69
stdev		4.06			4.42

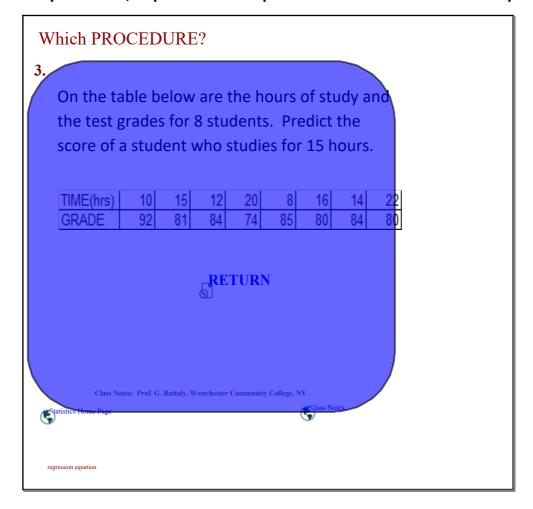


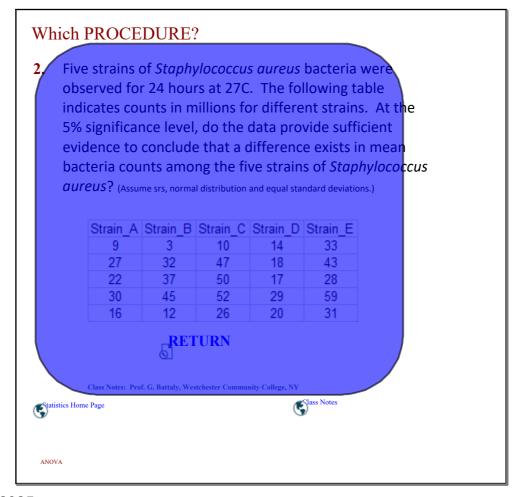
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4. Sediment ammonium concentrations in the seagrass beds of Corpus Christi Bay (CCB) were compared with that in Lower Laguna Madre (LLM) using independent random samples. Summary statistics follow. At the 1% significance level, is there sufficient evidence to conclude that the mean sediment ammonium concentration in CCB exceeds that in LLM? (Assume normal distributions.)

	CCB	LLM		
MEAN	115.1	24.3		
STANDEV	79.4	10.5		
n	51	19		

RETURN

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non-pooled t Test

Which PROCEDURE?

9. In a study of the picoplankton in San Francisco Bay, the following number of picoplankton concentration in units of 10^7 cells per liter resulted from independent samples in the North and South Bays. At the 5% significance level, do the data provide sufficient evidence to conclude that the mean concentrations of the picoplankton population differ between the North and South Bays? (Assume the populations have the same shape.)

NORTH	16.2	11.2	24.8	36.4	15	23.6	12.1
SOUTH	9.8	18.7	26	7.4	15		



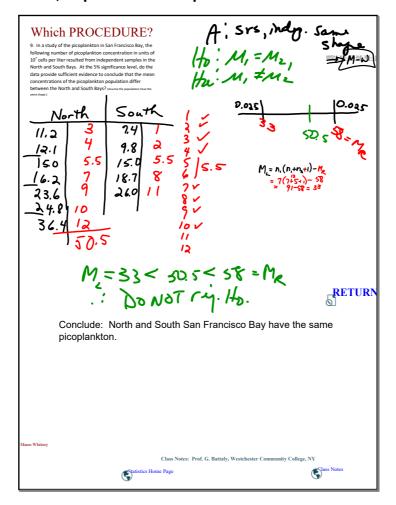
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8. Patients with glaucoma in one eye were checked for corneal thickness. A random sample was selected of both the glaucoma eye and the normal eye, resulting in the following data. At the 10% significance level, do the data provide sufficient evidence to conclude that mean corneal thickness is greater in normal eyes than in eyes with glaucoma? (Assume normal distribution.)

NONWAL	GLAUCOMA	_RETURN
484	488	STORIV
478	478	2
492	480	
444	426	
436	440	
398	410	
464	458	
476	460	
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7. Members of the American Statistical Association were asked which method they preferred for receiving ballots for annual elections. At the 5% significance level, do the data provide sufficient evidence to conclude that degree and preference are associated?

	PhD	MA	Other	
Mail	65	18	3	
Email	166	71	2	
Both	84	23	5	
N/A	73	55	1	



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Chi Square Independence

Which PROCEDURE?

6. In an article on pre-natal development, crown-rump measurements were taken for randomly selected developing fetuses. The table below shows ages in weeks and length of crown-rump in millimeters. At the 1% significance level, are the age and crown-rump of fetuses linearly correlated? (Assume equal standard deviations, normal populations, and independent sampling.)

age (wks)	10	10	13	13	18	19	19	23	25	28
crown-rump (mm)	66	66	108	106	161	166	177	228	235	280



Correlation t-Test

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Sediment ammonium concentrations in the seagrass beds of Corpus Christi Bay (CCB) were compared with that in Lower Laguna Madre (LLM) using independent random samples. Summary statistics follow. At the 1% significance level, is there sufficient evidence to conclude that the standard deviation of sediment ammonium concentration in LLM is less than that in CCB? (Assume normal distributions.)

	CCB	LLM
MEAN	115.1	24.3
STANDEV	79.4	10.5
n	51	19



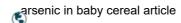
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2 sample standard deviation F-test

Which PROCEDURE?



11. It's no secret that infants ingest traces of arsenic with every bite of rice cereal. Widespread reporting on the problem began in 2017, when tests by Consumer Reports found arsenic in rice and rice-based foods, including infant rice cereal. Rice readily absorbs arsenic from the environment, about 10 times more of it than other grains.

At the 5% significance level, is there a difference in arsenic levels in the 2 types of rice? (Assume srs, independence, and normal distr.)

		mean	
	n	(ppb)	stdev
Rice	20	73.5	20.21
Brown Rice	22	95.7	38.15



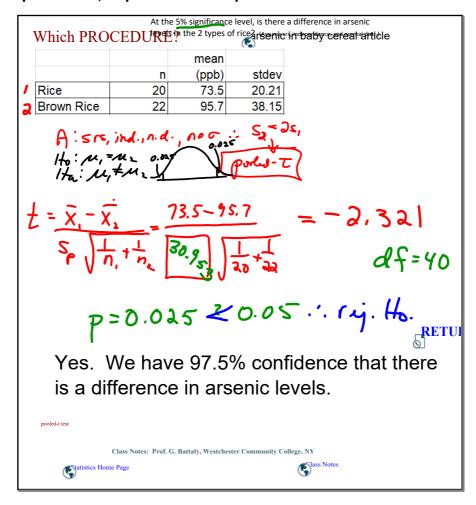
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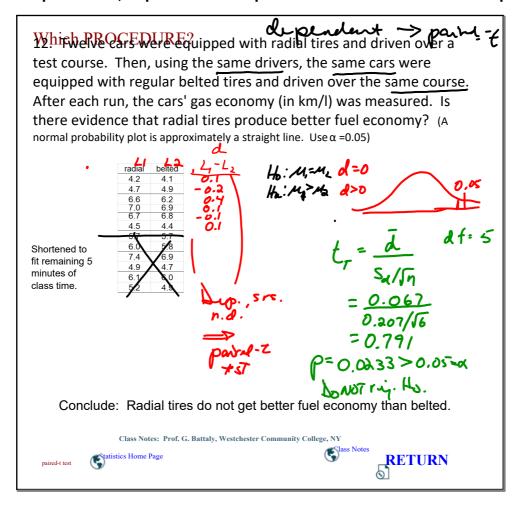


12. Twelve cars were equipped with radial tires and driven over a test course. Then, using the same drivers, the same cars were equipped with regular belted tires and driven over the same course. After each run, the cars' gas economy (in km/l) was measured. Is there evidence that radial tires produce better fuel economy? (A normal probability plot is approximately a straight line. Use α =0.05)

,	•	
	belted	radial
	4.1	4.2
	4.9	4.7
	6.2	6.6
	6.9	7.0
RETU	6.8	6.7
©	4.4	4.5
	5.7	5.7
	5.8	6.0
	6.9	7.4
	4.7	4.9
	6.0	6.1
	4.9	5.2

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14. Independent random samples of 17 sophomores and 13 juniors attending a large university yield the following data on grade point averages. (Sophomore GPA: mean=2.840, s=0.520; Junior GPA: mean=2.981, s=0.309)

At the 5% significance level, do the data provide sufficient evidence to conclude that the mean GPAs of the sophomores and juniors at the university differ? (Assume normal distribution.)



Soph	Junior
3.04	2.56
1.71	2.77
3.30	2.70
2.88	3.00
2.11	2.98
2.60	3.47
2.92	3.26
3.60	3.20
2.28	3.19
2.82	2.65
3.03	3.00
3.13	3.39
2.86	2.58
3.49	
3.11	
2.13	
3.27	

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In an article on pre-natal development, crown-rump measurements were taken for developing fetuses. The table below shows ages in weeks and length of crown-rump in millimeters. At the 1% significance level, are the age and crown-rump of fetuses linearly correlated? (Assume equal standard deviations, normal populations, and independent sampling.)

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Correlation t-Tes

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Which PROCEDURE?

15. The ankle brachial index (ABI) compares the blood pressure of a patient's arm to the blood pressure of the patient's leg. The ABI can be an indicator of different diseases, including arterial diseases. A healthy (or normal) ABI is 0.9 or greater.

In a study by M. McDermott et al. titled "Sex Differences in Peripheral Arterial Disease: Leg Symptoms and Physical Functioning" (Journal of the American Geriatrics Society, Vol. 51, No. 2, \pp. 222–228), the researchers obtained the ABI of 187 randomly selected women with peripheral arterial disease. The results were a mean ABI of 0.64 with a standard deviation of 0.15. At the 1% significance level, do the data provide sufficient evidence to conclude that, on average, women with peripheral arterial disease have an unhealthy ABI?



1 Sample t-Test

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cheerNurses.mp4