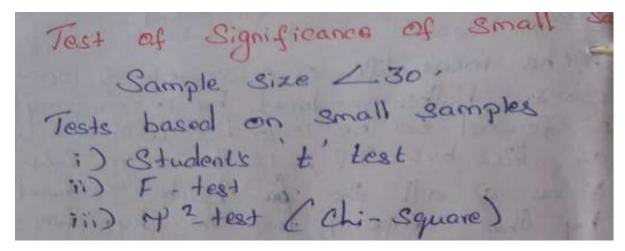


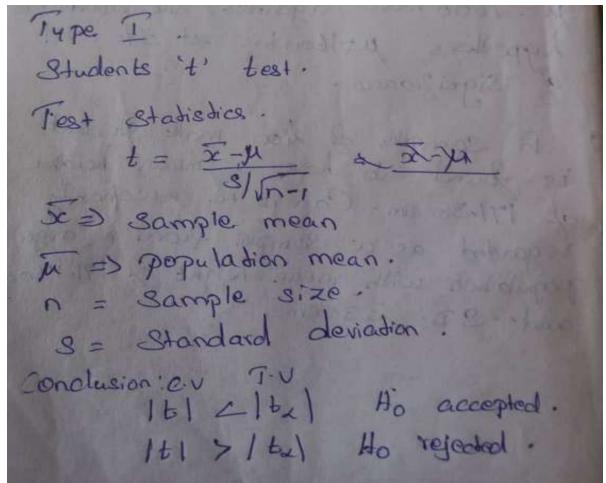
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Topic: 1.5 – t-distribution – Single mean





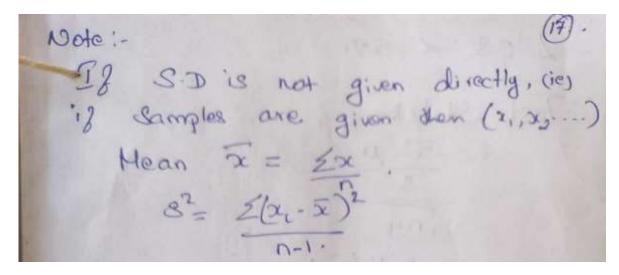


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Problems.

1. The mean weekly Sales of Soap bars in departmental stores was 146.3 bars per store. After an advertising compaign the mean weekly sales in 22 stores for a dypad week increased to 153.7 and showed a s.D. of 17.2. Was the advertising campaign successful.

Soln: $\mu = 146.3$ n = 22. $\pi = 153.7$ s = 17.2.

140: $\mu = 146.3$ h = 146.3 h = 146.3 h = 146.3 h = 146.3 h = 146.3



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L. 0.8:
$$\alpha = 5.7$$
.

Test Statistics
$$E = \frac{\overline{x} - \mu}{s}$$

$$\sqrt{n-1}$$

$$= \frac{153.7 - 146.3}{17 - 2/\sqrt{22-1}} = 1.97$$

$$|E| = 1.97$$



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2). The mean lize time of a sample of 25 glurorescent light bulbs produced by a company is computed to be 1570 hours with S.D of 120 hours. The company claims that the average lize of the bulbs produced by the company is 1600 hours. Using the claim acceptable.

N = 25 $\bar{x} = 1570$. E = 120. $\mu = 1600$.

Degree & Freedom = 25 - 1 = 24.

Ho: $\mu = 1600$ $\mu = 1600$



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$$t = \frac{x - \mu}{s/\ln 1} = \frac{1570 - 1600}{120 / 124}.$$

$$= \frac{-30}{24 \cdot 49} = -1.22$$

$$t = -1.22 \quad |t| = 1.22.$$
Cridical Value
$$L = 540 \quad \text{Dof} = 24$$

$$t_2 = 2.064$$
Conclusion:
$$C \cdot V \quad \text{T.V}$$

$$1.22 \cdot L \quad 2.064$$
Ho accepted.

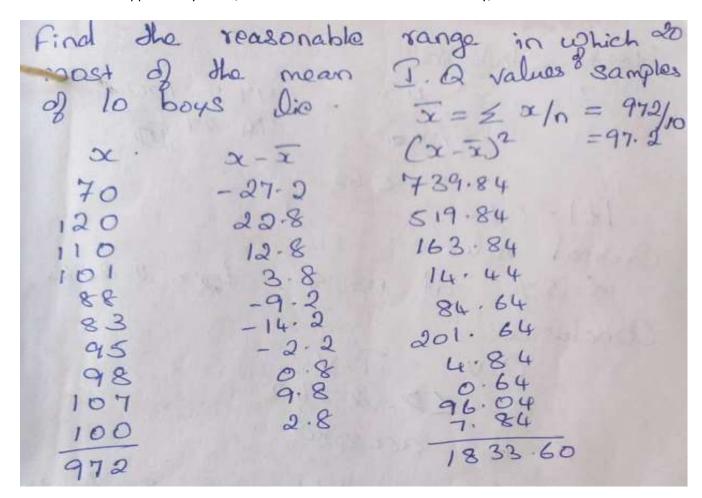
3). A random sample of 10 boys had the following I.O's. 70,120,110,101, 88,83,95,98,107,100. Dot these data support the assumption of a population mean IQ. of 100? Find



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$$S^{2} = \underbrace{\underbrace{S(x_{i} - \bar{x})^{2}}_{h-1}} = \underbrace{1833.60}_{9} = 203.73$$

$$S.D = \underbrace{Variance}_{h-1} = \underbrace{\sqrt{203.73}}_{9} = 14.27$$

$$H_{0}: \mu = 100$$

$$H_{1}: \mu \neq 100$$

$$2.0.8 = 5.7.$$



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Test Stadistics: $t = \frac{x - \mu}{s/m_0} = \frac{94.2 - 100}{14.24 \frac{100}{100}}$ It 1 = 0.62.

Critical value. d = 590 at n = 9. $t_{x} = 2.262$.

Conclusion:

C. V. T. V. $0.62 \angle b$. 2.262.

... Ho. accepted.

1) The following table gives the lengths of 12 students samples of Egyptian cotton taken from a large consignment 18, 46, 49, 46, 52, 45, 43, 47, 47, 46, 47, 50 Consignment be taken as the



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TC =	£x _ 566	= 47.16.
	n - 12	
DC.	DC - X	$(\overline{x}-\overline{x})^2$
48	0.84	0.71
46	-1.16	1.35
49	1.84	3.39
46	21.16	23.43
52	4.84	4.67
45	-2.16	17.31
43	-4.16	0.03
47	-0.16	0.03
47	-0.16	1. 35
46	-1.16	0.03
47	-0.16	8.07
50	2.84	61.72
566		22

Level of Significale: 5%.



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$$t = \frac{x - \mu}{s/\kappa}$$
= $\frac{47.16 - 46}{2.37/\sqrt{52}} = 1.69$

$$t = 1.69.$$
Critical Value
$$\lambda = 5.1. \text{ Dof} = 12-1=11$$

$$\delta_{\lambda} = 2.20$$
Conclusion:-
C-V
$$1.69 > 2.20$$
Ho accepted.