MA8452-STATISTICS AND NUMERICAL METHODS

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UNIT-1 TESTING OF HYPOTHISIS

• <u>Test of Hypothesis (Large Sample Tests)</u>

Large sample tests (Test based in Normal Distribution.

Type - I: (Test of significance of single mean) Let $1 \ 2 \ x, \dots, x \ n \ x$ be a sample of size (n 30) taken from a population with mean and S.D.

Let x be the sample mean. Assume that the population is Normal. To test whether the difference between Population mean and sample mean x is significant or not and this sample comes from the normal population whose mean is or not. Normal distribution.)

- Population: A population consists of collection of individual units, which may be person's or experimental outcomes, whose characteristics are to be studied.
- Sample: A sample is proportion of the population that is studied to learn about the characteristics of the population.
- Random sample: A random sample is one in which each item of a population has an equal chance of being
- Null Hypothesis (H0) The hypothesis tested for possible rejection under the assumption that it is true is usually called null hypothesis. The null hypothesis is a hypothesis which reflects no change or no difference. It is usually denoted by H0

3) The mean lightime of a sample of 100 light tubes Produced by a company is found to be 1580 hours with Standavid deviation of 90 haves. Test the hypothesis that the mean lightime of the tubes produced by the company is 1600 hours.

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grom:

Given,

Sample side n=200. Sample mean X=1580. Sample S.D S=90. Population mean p=1600. Ho: p=1600.

Hi: pit1600 (two tailed).

 $Z = \frac{\overline{x} - \mu}{\sqrt{\frac{s^{a}}{6}}} = \frac{1580 - 1600}{\sqrt{\frac{90^{2}}{100}}} = \frac{-20}{9} = -2.2222.$

121=2.2222

At 57. , 12x1=1.96. 2.222271.96=) reject Ho. DA machine puts out 16 impergent articles in a sample of 500. After the machine is overhacked, it puts out 3 imperject orticles in a batch of 100. Has the machine improved?

Doln:

Before overhauled After overhauled.

samplerize na=100. Sample size n= 500 Sample proportion & 10:= 16 of imporgent articles } 10:= 16 500 Sample Proportion 4/2= 3.

 $\frac{1}{p_{-1}} = \frac{1}{p_{1} + p_{2}} = \frac{16+3}{600} = \frac{19}{600} = \frac{19}{600} = \frac{19}{600} = \frac{581}{600}$

Ho: PI=Pac The machine has not improved). H1: PitP2 (the machine is improved)

$$Z = \frac{P_{1} - P_{2}}{\sqrt{\frac{P_{0}}{n_{1}} + \frac{P_{0}}{n_{2}}}} = \frac{\frac{16}{500} - \frac{2}{100}}{\frac{19}{500} \times \frac{58}{500}} = \frac{19}{500} \times \frac{581}{500}}{\frac{19}{500} \times \frac{581}{500}} = \frac{19}{500} \times \frac{581}{500}}{\frac{100}{100}}$$

57., Za = 1.76.

0. 1042 cl.96 =) Accept Ho =) The machine

has not improved.

THANK YOU