Hypothesis Testing

Null - correct - 90% - $p = 0.9$

Alternate - false - 10% - $p < 0.9$

$$Z = \frac{\hat{p} + \frac{0.5}{n} - p_0}{\sqrt{\frac{p_0(1-p_0)}{n}}}$$

$$Z = \frac{5/8 + \frac{0.5}{8} - 0.9}{\sqrt{\frac{0.9 (1-0.9)}{8}}}$$

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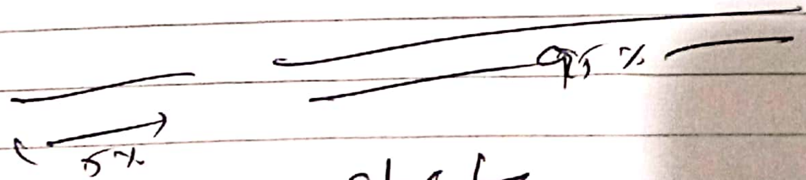
CL = 95%

Under the tail - critical region



1) Z critical :

1) Set CL
2) Critical region
3) Decide 1/2 tail
4) direct / alt
5) Z cal
6) Z table

Hypothesis testing problem

5 year mean 2.75

1) sample size n = 256

sample mean $\bar{x}$ = 2.85

σ = 0.65

2) Next

mean $\frac{x - \mu}{\sigma}$

$z = \frac{x - \mu}{\frac{\sigma}{\sqrt{n}}}$

$= \frac{2.85 - 2.75}{\frac{0.65}{\sqrt{256}}}$

Critical region 0.05

$= 0.1 \times \frac{16}{0.65}$

$= \frac{1.6}{0.65}$

$= 2.46$

Under the test: Reject Null

Hypothesis testing Assignments

2) $\mu = 52$ $n = 100$

$\sigma = 4.50$

$\frac{\bar{x} - \mu}{\sigma / \sqrt{n}}$

~~52~~ 52.80 −

at 5% level of significance

Critical value = 0.05

$$= \frac{52.80 - 52}{\frac{4.50}{\sqrt{100}}}$$

$$= \frac{0.80}{\frac{4.50}{10}}$$

$$= \frac{0.80}{0.45} = 1.78$$

reject null.

3) $\mu = 34$ ppm $\sigma = 8$ ppm

$n = 50$

at 1% critical 0.01

$$= \frac{-(34 - 32.5)}{\frac{8}{\sqrt{50}}}$$

$$= -1.5 \times \frac{\sqrt{50}}{8} =$$

$$= -\frac{1.5 \times 7.07}{8} = -1.32$$

We cannot reject null.

4) $t = \frac{12 - 16}{\frac{1.5}{\sqrt{10}}}$

$= -4 \times \frac{\sqrt{10}}{1.5}$

=

4) $t = \frac{\text{sample mean} - \text{population mean}}{\frac{s}{\sqrt{n}}}$

$= \frac{12 - 10}{\frac{1.5}{\sqrt{16}}}$

$= 2 \times \frac{4}{1.5}$

$= 2 \times 4 \times \frac{3}{2}$

$t_{value} = 12$

$3/2 = 1.5 \times 2 = 3.0$

6) n = 100, df = 4, 100/4

χ² critical with 0.05 at 3 df = 7.82

not reject

Observed	Expected		
41	25	$\frac{(16)^2}{25}$	10.24
19	25	$\frac{36}{25}$	1.44
24	25	1/25	0.04
16	25	81/25	3.24
			14.96

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