**Acharya Institute of Technology**

**Acharya Dr. S. Radhakrishnan Road, Acharya P.O, Soladevanahalli, Bangalore - 560107. Karnataka, India.**

Department of Mathematics

A Brief Report on Flip class

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| **Student Group** | BHAVANA M V |
| **Year and Branch** | 2nd year III sem (2024-25) |
| **Topic of Flip class** | HYPOTHESIS PROBLEM |

EXPLANATION OF TOPIC:WRT TO QUESTION:

The question involves conducting a \*hypothesis test\* to determine if the mean grade of a particular school differs significantly from the overall mean grade, using \*5% and 1% significance levels\*.

Key concepts used:

1. \*Null and Alternative Hypotheses\*: Comparing the school's mean (\( \bar{x} = 75.9 \)) to the population mean (\( \mu = 74.5 \)).

2. \*Test Statistic Calculation\*: Using the formula \( Z = \frac{\bar{x} - \mu}{\sigma / \sqrt{n}} \).

3. \*Critical Values\*: Comparing the calculated \( Z \)-value (2.47) with critical values for two-tailed tests (\( \pm 1.96 \) for 5%, \( \pm 2.58 \) for 1%).

4. \*Decision Rule\*: Reject or fail to reject the null hypothesis based on \( Z \)-value and critical values.

\*Conclusion\*: The difference is significant at 5% but not at 1%.

QUESTION:In an examination given to students at a large number of different schools the mean grade was 74.5 and S.D grade was 8.At one particular school where 200 students took the examination the mean grade was 75.9.Discuss the significance of this result at both 5% and 1% level of significance

To answer this question:

We need to test the significance of the mean difference at 5% and 1% significance levels. This can be done using a hypothesis test for the population mean.

### Step 1: State the Hypotheses

- \*Null Hypothesis (\(H\_0\))\*: The mean grade of this school is the same as the overall mean.

\( H\_0: \mu = 74.5 \)

- \*Alternative Hypothesis (\(H\_a\))\*: The mean grade of this school is different.

\( H\_a: \mu \neq 74.5 \)

This is a two-tailed test.

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### Step 2: Calculate the Test Statistic

The formula for the test statistic (\(Z\)) is:

\[

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

\]

Where:

- \(\bar{x} = 75.9\) (sample mean),

- \(\mu = 74.5\) (population mean),

- \(\sigma = 8\) (standard deviation),

- \(n = 200\) (sample size).

Substitute the values:

\[

Z = \frac{75.9 - 74.5}{8 / \sqrt{200}}

\]

\[

Z = \frac{1.4}{8 / 14.14}

\]

\[

Z = \frac{1.4}{0.5657} \approx 2.47

\]

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### Step 3: Determine Critical Values

For a two-tailed test:

- At \*5% significance level\* (\(\alpha = 0.05\)): Critical values are \(\pm 1.96\),

- At \*1% significance level\* (\(\alpha = 0.01\)): Critical values are \(\pm 2.58\).

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### Step 4: Compare \(Z\)-value with Critical Values

- At 5%: \(Z = 2.47 > 1.96\), so we reject \(H\_0\).

- At 1%: \(Z = 2.47 < 2.58\), so we fail to reject \(H\_0\).

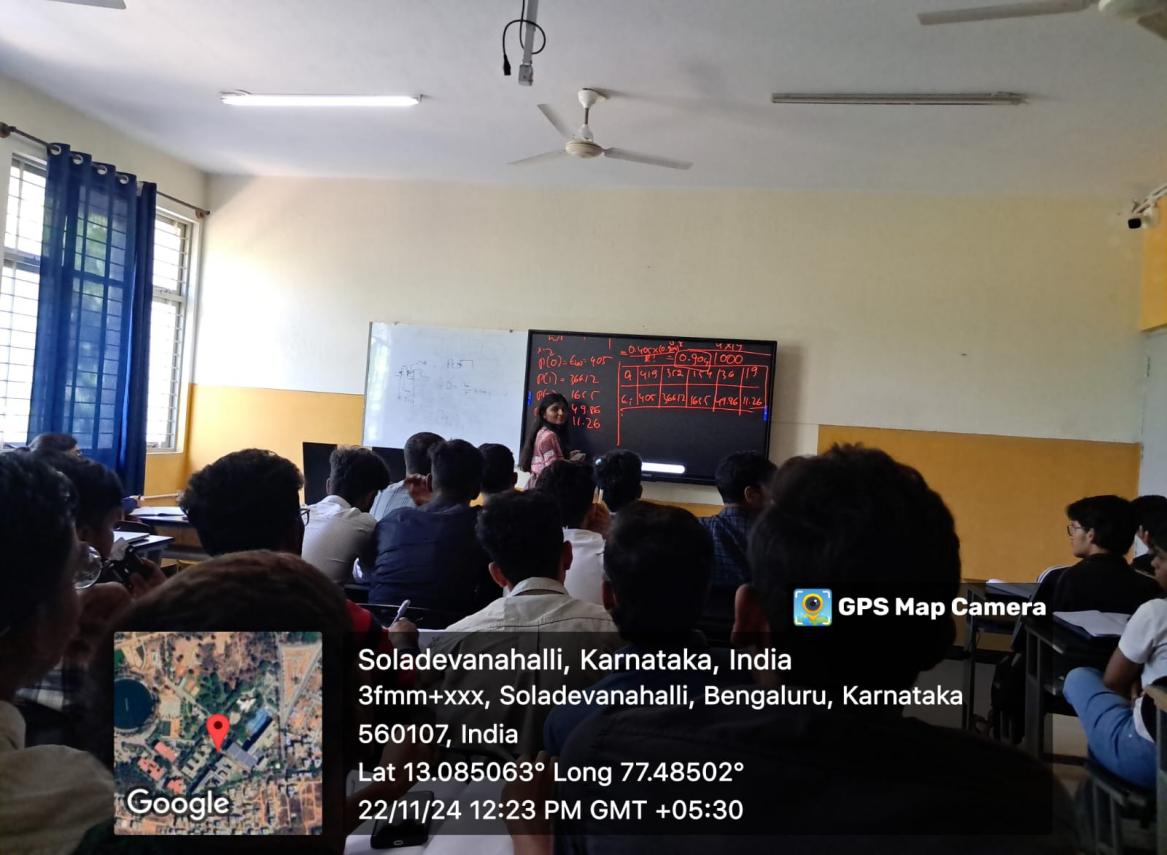
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### Conclusion

- At the \*5% level of significance\*, the result is significant; the mean grade is different from 74.5.

- At the \*1% level of significance\*, the result is not significant; we do not have enough evidence to conclude a difference.

Photo Gallery



Assessment Sheet

Acharya Institute of Technology

Acharya Dr. S. Radhakrishnan Road, Acharya P.O, Soladevanahalli, Bangalore - 560107. Karnataka, India.

Topic: Test for Significance

Year and Branch: 2nd year III sem

Date of Presentation: 12-10-2024

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| **SN** | **Name** | **USN** | **Signature** |
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Student/s Details:-

Final Remarks from Teacher/s: Student presented Test for hypothesis problem . They explained the problem based on test for statics. Overall presentation is good.