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Two tailed hypothesis test

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Two tailed hypothesis test

One tail test, rejection region on L.H.S.

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Two tailed hypothesis test

One tail test, rejection region on L.H.S.

One tail test, rejection region on R.H.S.

Hypothesis Testing *recap of formulas*

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Type of Test	*Null hypothesis contains…*	*Number of rejection regions*	*Cutoff value for the t-statistic*
Two tail test			

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Type of Test	*Null hypothesis contains…*	*Number of rejection regions*	*Cutoff value for the t-statistic*
Two tail test	=		

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Two tail test	**=**	**Two, (on left & right)**	

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Type of Test	*Null hypothesis contains…*	*Number of rejection regions*	*Cutoff value for the t-statistic*
Two tail test	**=**	**Two, (on left & right)**	**+/- |T.INV(α/2, n-1)|**

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Hypothesis Testing

Example

(when the Null hypothesis naturally turns out to have a strict inequality)

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We wish to test a claim that the average age of Men MBA students across various MBA programs in the US is greater than 28 years. For this we collect data on average ages of men MBA students across a sample of 40 MBA programs in the US.

The data is in the file Average Age.xlsx.

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Step 1 **: Formulate Hypothesis**

Null Hypothesis H_0: $\mu > 28$

Alternate Hypothesis H_A: $\mu \leq 28$

Hypothesis Testing

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Alternate Hypothesis H_A: $\cancel{\mu \leq}$ 28

Null hypothesis cannot have… ≠, > or <

Hypothesis Testing

Example
(when the Null hypothesis naturally turns out to have a strict inequality)

We wish to test a claim that the average age of Men MBA students across various MBA programs in the US is greater than 28 years. For this we collect data on average ages of men MBA students across a sample of 40 MBA programs in the US.

The data is in the file Average Age.xlsx.

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Alternate Hypothesis $H_A: \cancel{\mu \le 28}$

$\longrightarrow$

$H_0: \mu \le 28$

$H_A: \mu > 28$

Null hypothesis cannot have… $\neq$, $>$ or $<$

Hypothesis Testing

Step 1 **: Formulate Hypothesis**

$$H_0: \mu \leq 28$$
$$H_A: \mu > 28$$

Hypothesis Testing

Step 1 **: Formulate Hypothesis**

H_0: $\mu \leq 28$

H_A: $\mu > 28$

Step 2 **: Calculate the t-statistic**

$$\text{t-statistic} = \frac{\bar{x} - \mu}{s/\sqrt{n}}$$

Hypothesis Testing

Step 1 **: Formulate Hypothesis**

H_0: $\mu \leq 28$

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Step 2 **: Calculate the t-statistic**

$$\text{t-statistic} = \frac{\bar{x}-\mu}{s/\sqrt{n}} = 0.2232$$

Hypothesis Testing

Step 1 **: Formulate Hypothesis**

$$H_0: \ \mu \le 28$$
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Step 2 **: Calculate the t-statistic**

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Step 3 **: Cutoff values for the t-statistic**

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[single tail test, rejection region on the R.H.S.]

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$$\text{t-cutoff} = +|T.INV(\alpha, n-1)|$$

Hypothesis Testing

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Step 3 **: Cutoff values for the t-statistic**

[single tail test, rejection region on the R.H.S.]

t-cutoff = +|T.INV(α, n-1)| $\alpha = 0.05$

Hypothesis Testing

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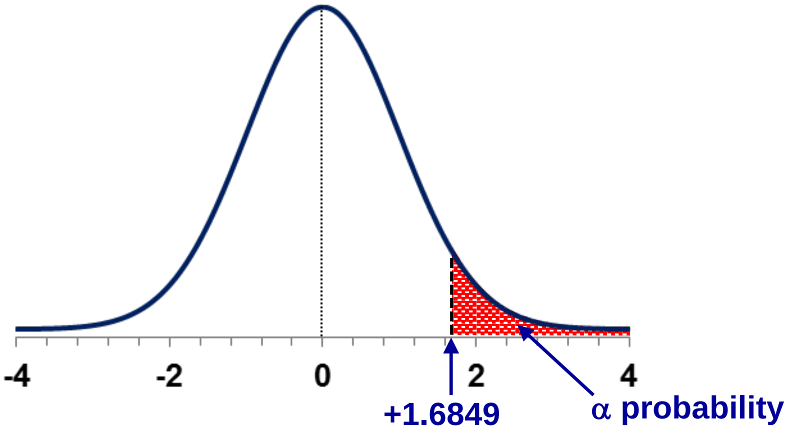
Step 2 : Calculate the t-statistic t-statistic = 0.2232

Step 3 **: Cutoff values for the t-statistic**

[single tail test, rejection region on the R.H.S.]



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Hypothesis Testing

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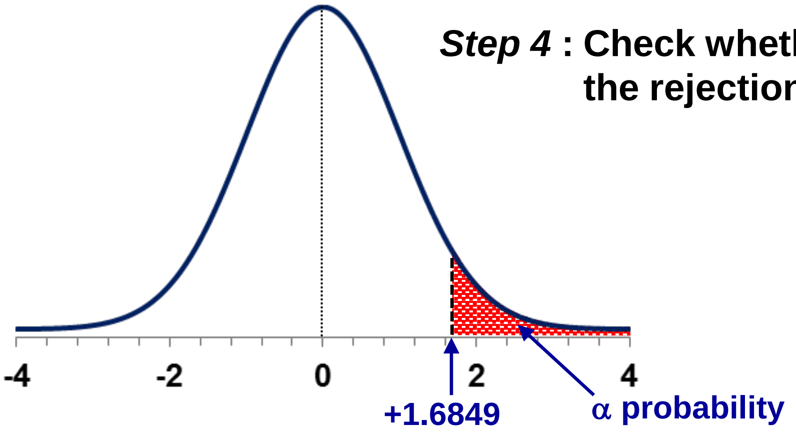
Step 3 : Cutoff values for the t-statistic
[single tail test, rejection region on the R.H.S.]

Step 4 : Check whether t-statistic falls in the rejection region



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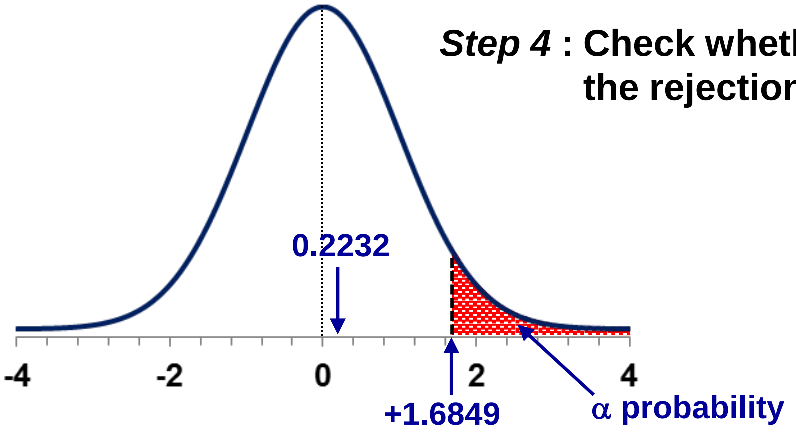

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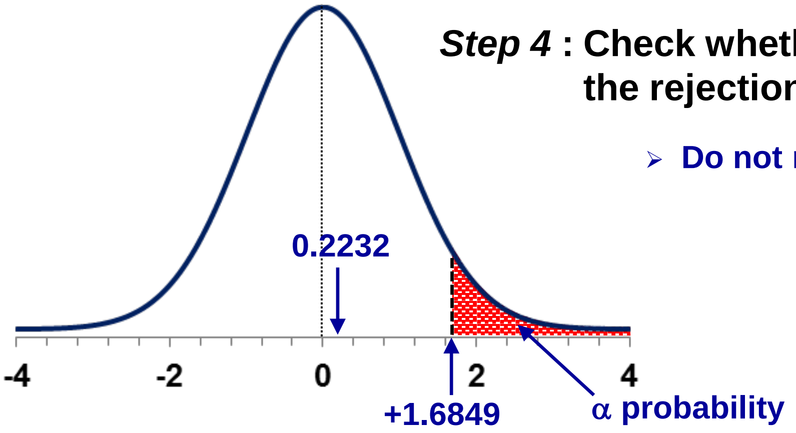

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- **Do not reject Null hypothesis**

Hypothesis Testing

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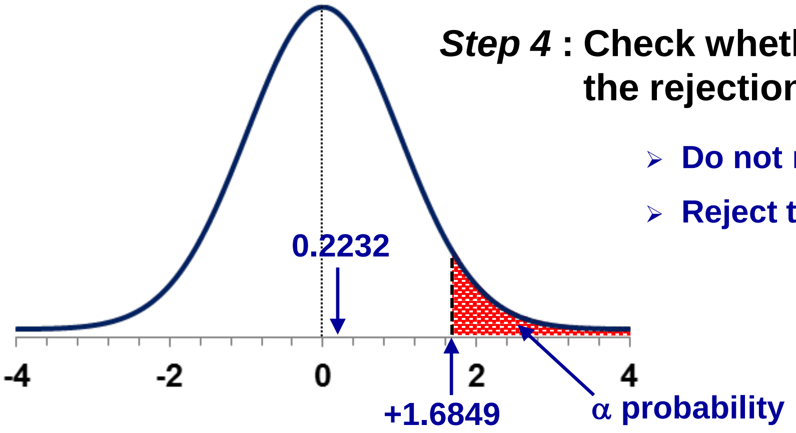

Step 4 : Check whether t-statistic falls in the rejection region

- Do not reject Null hypothesis
- Reject the Alternate hypothesis

Hypothesis Testing

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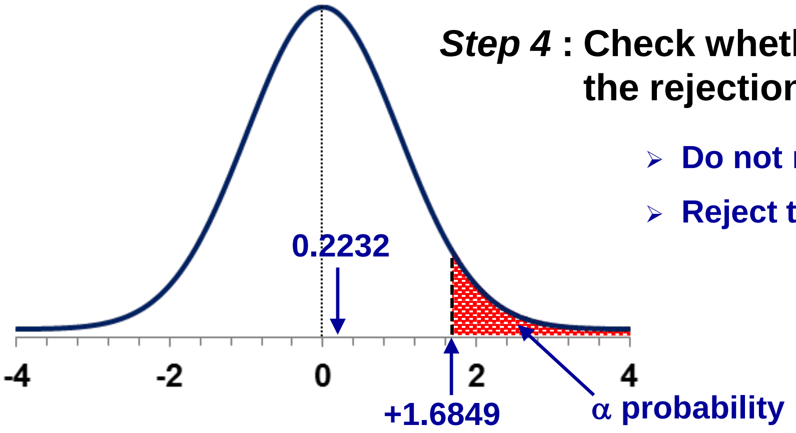

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Hypothesis Testing

cannot reject

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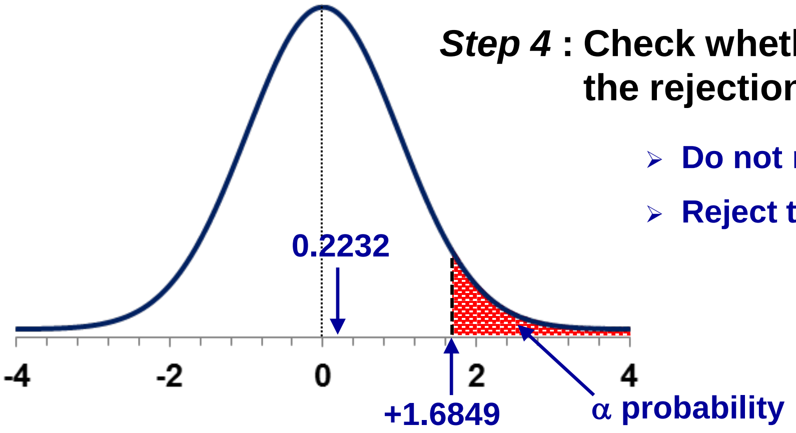

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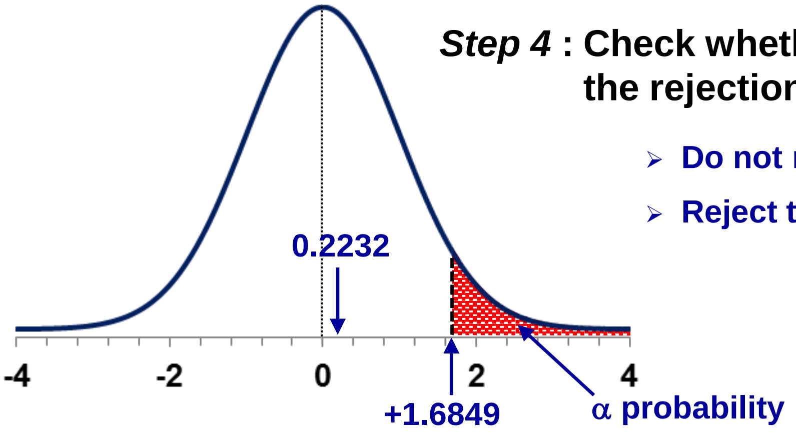

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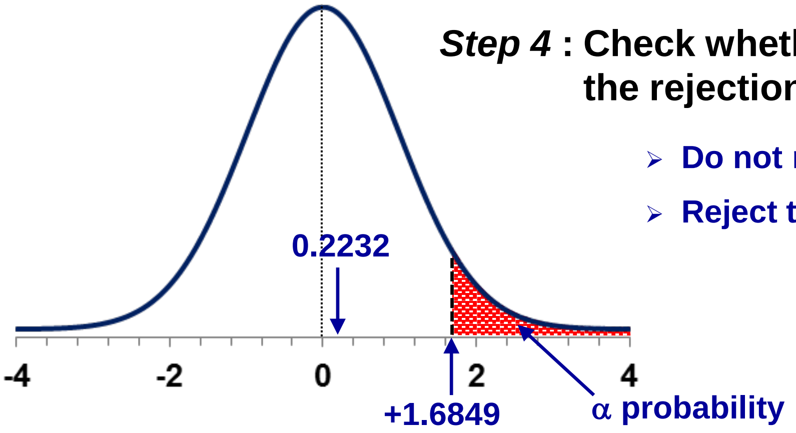

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