Basic Steps for Hypothesis Testing

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Hypothesis testing or test of significance is a statistical method for testing a claim about a population parameter.

Step 1:

Identify null (H_0) and alternate (H_1 or H_a) hypothesis. Null hypothesis (H_0) is the statement that shows the given population parameter is equal to the claimed value, whereas alternate hypothesis (H_1) shows the given population parameter is different from the claimed value.

H_0: =

H_1: ≠, >, <

Select the significance level, α: The significance level, α indicates the probability of rejecting the null hypothesis when it is true or accepting the null hypothesis when it is false. The values generally used for α are 0.05, 0.01, and 0.10.

Step 2:

Calculate the test statistic

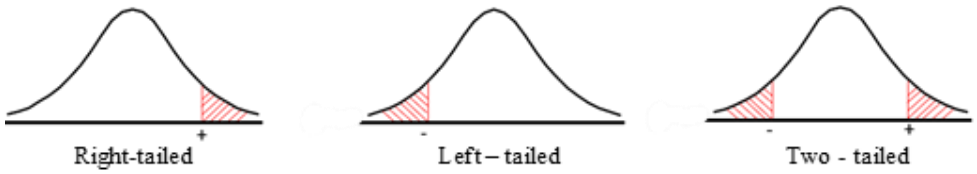
- Making decision about the null hypothesis is based on the value of the test statistic
- *z*-score or *t*-score – different formula for each sampling distribution.

Step 3:

Find the critical value. Determine if the hypothesis test is right-tailed or left-tailed or two- tailed.

a. One-tailed test: z_α / t_α
   - If H_1 has a condition, > (greater than), then it is right tailed, where z_α / t_α will be +
   - If H_1 has a condition, < (less than), then it is left tailed, where z_α / t_α will be -

b. Two-tailed test: $z_{\alpha/2} / t_{\alpha/2}$
   - If H_1 has a condition, ≠ (not equal to), then it is two-tailed, where $z_{\alpha/2} / t_{\alpha/2}$ will be ±



degrees of freedom (df) = n-1

Step 4:

Find the *P*-value

- Look up test statistic along with df and find *P*-value.

Step5:

Make the conclusion

a. Based on *P*-value
   - If *P*-value < α, then reject H_0
   - If *P*-value > α, then fail to reject H_0

b. Based on critical value
   - If the test statistic falls in the rejection region, reject H_0
   - If the test statistic does not fall in the rejection region, then fail to reject H_0