Response variable is in continuous scale

Transform the data

H_0: The population is Normal

$X_i \sim N(\mu_i, \sigma_i)$, unknown parameters, i=1…k

- Lilliefors' test
- Shapiro-Wilk test *(better)*

Reject H_0

H_0: The k populations have the same scale parameter

- Siegel-Tukey test or Ansari-Bradley test
- Conover's Squared Ranks test
- Levene's test using the median

Reject H_0

Not rej. H_0

H_0: The k samples come from identical populations

- Kruskal-Wallis test

Reject H_0

NONPARAMETRIC MULTIPLE COMPARISON TESTS

H_0: Two populations have the same median

$\tilde{\mu}_i = \tilde{\mu}_j (i \neq j)$

- Hodges-Lehmann test for independent samples
- Steel-Dwass test (or Dwass-Steel-Critchlow-Fligner test)
- Conover-Inman test
- Nemenyi test (or Nemenyi-Damico-Wolfe-Dunn test)
- Dunnet's T3 or C procedures (recommended if the df is small or large, respectively)
- Games-Howell test

Not rej. H_0

H_0: The k Normal populations are homoscedastic

$\sigma_1^2 = \sigma_2^2 = \ldots = \sigma_k^2 = \sigma^2$

- Bartlett's test
- Levene's test *(better)*

Reject H_0

H_0: The k Normal populations have the same mean

$\mu_1 = \mu_2 = \ldots = \mu_k = \mu$

- Brown-Forsythe test
- Welch's test *(better)*

Reject H_0

Not rej. H_0

H_0: The k Normal and homoscedastic populations have the same mean

$\mu_1 = \mu_2 = \ldots = \mu_k = \mu$

- **ANOVA**

Reject H_0

MULTIPLE COMPARISON TESTS

H_0: Two populations have the same mean

$\mu_i = \mu_j (i \neq j)$

- Tukey's HSD test / Tukey-Kramer test *(better)*
- Hochberg (GF2)
- Scheffé's test

One-way ANOVA process and nonparametric counterparts (I)

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Response variable is in metric scale

H_0: The population is Normal

$X_i \sim N(\mu_i, \sigma_i)$, unknown parameters, i=1…k

- Lilliefors' test
- Shapiro-Wilk test *(better)*

Not rej. H_0

H_0: The k Normal populations are homoscedastic

$\sigma_1^2 = \sigma_2^2 = \ldots = \sigma_k^2 = \sigma^2$

- Bartlett's test
- Levene's test *(better)*

Not rej. H_0

H_0: The k Normal and homoscedastic populations have the same mean

$\mu_1 = \mu_2 = \ldots = \mu_k = \mu$

- **ANOVA**

Reject H_0

MULTIPLE COMPARISON TESTS

H_0: Two populations have the same mean

$\mu_i = \mu_j$ (i≠j)

- Tukey's HSD test / Tukey-Kramer test *(better)*
- Hochberg (GF2)
- Scheffé's test

Reject H_0

H_0: The k Normal populations have the same mean

$\mu_1 = \mu_2 = \ldots = \mu_k = \mu$

- Brown-Forsythe test
- Welch's test

Reject H_0

NONPARAMETRIC MULTIPLE COMPARISON TESTS

H_0: Two populations have the same median

$\tilde{\mu}_i = \tilde{\mu}_j$ (i≠j)

- Hodges-Lehmann test for independent samples
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- Dunnet's T3 or C procedures (recommended if the df is small or large, respectively)
- Games-Howell test

Reject H_0

H_0: The k samples come from identical populations

- Kruskal-Wallis test

Reject H_0

H_0: The k populations have the same scale parameter

- Siegel-Tukey test or Ansari-Bradley test
- Conover's Squared Ranks test
- Levene's test using the median

Reject H_0

(Multiple) Correspondence Analysis

Response variable is in ordinal scale

One-way ANOVA process and nonparametric counterparts (II)

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