$\bar{Y} = \frac{Y_1+Y_2+\cdots+Y_n}{n} = \frac{1}{n}\sum_{i=1}^{n} Y_i$ $\quad s = \sqrt{\frac{1}{n-1}\sum_{i=1}^{n}(Y_i - \bar{Y})^2}$

$\mathrm{SD}(\bar{Y}) = \sigma/\sqrt{n}$ $\quad \mathrm{SE}(\bar{Y}) = s/\sqrt{n}$ $\quad t = \frac{\bar{Y}-\mu}{s/\sqrt{n}}$ $\quad$ d.f.$= n-1$ $\quad \bar{Y} \pm t_{n-1}^{(1-\alpha/2)}\frac{s}{\sqrt{n}}$

$\mathrm{SD}(\bar{Y}_2 - \bar{Y}_1) = \sigma\sqrt{\frac{1}{n_1}+\frac{1}{n_2}}$ $\quad \mathrm{SE}(\bar{Y}_2 - \bar{Y}_1) = s_p\sqrt{\frac{1}{n_1}+\frac{1}{n_2}}$ $\quad s_p = \sqrt{\frac{(n_1-1)s_1^2+(n_2-1)s_2^2}{n_1+n_2-2}}$

$t = \frac{(\bar{Y}_2-\bar{Y}_1)-(\mu_2-\mu_1)}{s_p\sqrt{\frac{1}{n_1}+\frac{1}{n_2}}}$ $\quad$ d.f.$= n_1+n_2-2$ $\quad (\bar{Y}_2 - \bar{Y}_1) \pm t_{n_1+n_2-2}^{(1-\alpha/2)} s_p\sqrt{\frac{1}{n_1}+\frac{1}{n_2}}$

T=sum of ranks in group 1 $\quad Z = \frac{T-\mathrm{Mean}(T)}{\mathrm{SD}(T)}$ $\quad \mathrm{Mean}(T) = n_1(n_1+n_2+1)/2$

$\mathrm{SD}(T) = s_R\sqrt{\frac{n_1 n_2}{n_1+n_2}}$ $\quad s_R$ is the standard deviation of all ranks.

K=number of positive differences $\quad n$=number of nonzero differences $\quad Z = \frac{K-n/2}{\sqrt{n/4}}$

S=sum of positive ranks $\quad Z = \frac{S-\mathrm{Mean}(S)}{\mathrm{SD}(S)}$

n=number of nonzero differences $\quad \mathrm{Mean}(S) = n(n+1)/4$ $\quad \mathrm{SD}(S) = \sqrt{\sum_{i=1}^{n} R_i^2/4}$

Source	D.F.	Sum of Squares	Mean Squares	F
Between	$I-1$	$SSB = \sum_{i=1}^{I} n_i(\bar{Y}_i - \bar{Y})^2$	$MSB = \frac{\sum_{i=1}^{I} n_i(\bar{Y}_i-\bar{Y})^2}{I-1}$	$\frac{MSB}{MSW}$
Within	$n-I$	$SSW = \sum_{i=1}^{I}\sum_{j=1}^{n_i}(Y_{ij} - \bar{Y}_i)^2$	$MSW = \frac{\sum_{i=1}^{I}\sum_{j=1}^{n_i}(Y_{ij}-\bar{Y}_i)^2}{n-I}$	
Total	$n-1$	$SSTO = \sum_{i=1}^{I}\sum_{j=1}^{n_i}(Y_{ij} - \bar{Y})^2$		

$$s_p = \sqrt{\frac{\sum_{i=1}^{I}(n_i-1)s_i^2}{n-I}} = \sqrt{MSW}$$

$\gamma = C_1\mu_1 + C_2\mu_2 + \cdots + C_I\mu_I$ $\quad g = C_1\bar{Y}_1 + C_2\bar{Y}_2 + \cdots + C_I\bar{Y}_I$ $\quad \mathrm{Mean}(g) = \gamma$

$\mathrm{SE}(g) = s_p\sqrt{\frac{C_1^2}{n_1}+\frac{C_2^2}{n_2}+\cdots+\frac{C_I^2}{n_I}}$ $\quad t = \frac{g-\gamma}{\mathrm{SE}(g)}$ $\quad$ d.f.$= n-I$ $\quad g \pm t_{n-I}^{(1-\alpha/2)}\mathrm{SE}(g)$

$F = \frac{[\mathrm{RSS(red.)} - \mathrm{RSS(full)}]/[\mathrm{df}_{\mathrm{RSS(red.)}} - \mathrm{df}_{\mathrm{RSS(full)}}]}{\mathrm{RSS(full)}/\mathrm{df}_{\mathrm{RSS(full)}}}$ $df = df_{RSS(red.)} - df_{RSS(full)}$ and $df_{RSS(full)}$

$\mathrm{df}_{\mathrm{RSS}} = n - p$

$r = r_{XY} = \frac{\sum_{i=1}^{n}(X_i - \bar{X})(Y_i - \bar{Y})/(n-1)}{s_X s_Y}$

$\hat{Y} = \hat{\beta}_0 + \hat{\beta}_1 X$ $\hat{\beta}_1 = \frac{r \cdot S_Y}{S_X}$ $\hat{\beta}_0 = \bar{Y} - \hat{\beta}_1 \bar{X}$ $\hat{\sigma} = \sqrt{\frac{\sum_{i=1}^{n}(Y_i - \hat{Y}_i)^2}{n-2}} = s_Y \sqrt{(1 - r^2)\frac{n-1}{n-2}}$

$\mathrm{Mean}(\hat{\beta}_1) = \beta_1$ $\mathrm{SE}(\hat{\beta}_1) = \hat{\sigma}\sqrt{\frac{1}{(n-1)s_X^2}}$ $t = \frac{\hat{\beta}_1 - \beta_1}{SE(\hat{\beta}_1)}$ $d.f. = n - 2$

$\mathrm{Mean}(\hat{\beta}_0) = \beta_0$ $\mathrm{SE}(\hat{\beta}_0) = \hat{\sigma}\sqrt{\frac{1}{n} + \frac{\bar{X}^2}{(n-1)s_X^2}}$ $t = \frac{\hat{\beta}_0 - \beta_0}{SE(\hat{\beta}_0)}$ $d.f. = n - 2$

Source	D.F.	Sum of Squares	Mean Square	F	P-value	
Regression	1	$\sum_{i=1}^{n}(\hat{Y}_i - \bar{Y})^2$	$\frac{\sum_{i=1}^{n}(\hat{Y}_i - \bar{Y})^2}{1}$	$\frac{MSR}{MSE}$	$P(T^2 \geq \frac{MSR}{MSE})$	$T^2 \sim F(1, n-2)$
Error	$n - 2$	$\sum_{i=1}^{n}(Y_i - \hat{Y}_i)^2$	$\frac{\sum_{i=1}^{n}(Y_i - \hat{Y}_i)^2}{n-2}$			
Total	$n - 1$	$\sum_{i=1}^{n}(Y_i - \bar{Y})^2$				

$r^2 = 1 - \frac{SSE}{SSTO} = \frac{SSR}{SSTO}$

$\hat{Y} \pm t_{n-2}^{(1-\alpha/2)}\hat{\sigma}\sqrt{\frac{1}{n} + \frac{(X - \bar{X})^2}{(n-1)s_X^2}}$ $\hat{Y} \pm t_{n-2}^{(1-\alpha/2)}\hat{\sigma}\sqrt{1 + \frac{1}{n} + \frac{(X - \bar{X})^2}{(n-1)s_X^2}}$
