3. 检验假设：$H_0: \mu_0 = \mu_1 = 4.55$，$H_1: \mu_0 \neq \mu_1 = 4.55$.

$$t = \frac{\bar{x} - \mu_0}{\frac{s}{\sqrt{n}}}$$

拒绝域 $|t| > t_{\frac{\alpha}{2}}(n-1)$

$\therefore$ 不接受 H_0

则总体均值有显著变化.

10. 检验假设：$H_0: \sigma_1^2 = \sigma_2^2$，$H_1: \sigma_1^2 \neq \sigma_2^2$

令 $f = \frac{\sigma_2^2 S_{1n_1}^2}{\sigma_1^2 S_{2n_2}^2}$

$\bar{x} = 15.0125$,

$S_{1n_1}^2 = 0.8$

$\bar{y} = 14.997$. $f = \frac{S_{1n_1}^2}{S_{2n_1}^2} = 3.27$

$S_{2n_1}^2 = 0.244$.

$F_{\frac{\alpha}{2}}(n_1-1, n_2-1) = F_{\frac{0.05}{2}}(7,8) = 4.53$

$F_{1-\frac{\alpha}{2}}(n_1-1, n_2-1) = F_{0.975}(7,8) = \frac{1}{F_{0.025}(8,7)} = 0.204$

拒绝域 $f > 4.53$ 或 $f < 0.204$

由于 $f = 3.27$，$0.204 < f < 4.53$

则接受 H_0，$\sigma_1^2 = \sigma_2^2$

检验假设 $H_0: \mu_1 = \mu_2$. $H_1: \mu_1 \neq \mu_2$.

$T = \frac{\bar{X} - \bar{Y} - (\mu_1 - \mu_2)}{S_w\sqrt{\frac{1}{n_1} + \frac{1}{n_2}}}$ $S_w = \sqrt{\frac{(n_1-1)S_1^2 + (n_2-1)S_2^2}{n_1+n_2-2}}$

拒绝域

$|T| \geq t_{\frac{\alpha}{2}}(n_1+n_2-2)$ $T = 0.53$ $t_{\frac{\alpha}{2}}(n_1+n_2-2) = t_{0.025}(15) = 2.131$

则 $|T| < 2.131$

∴综上，可以认为两台机床产品的直径可以服从

13、检验假设 $H_0: \sigma^2 \leq \sigma_0^2 = 0.005^2$

$H_1: \sigma^2 > \sigma_0^2$

$$\chi^2 = \frac{(n-1)S^2}{\sigma_0^2} = 15.68 \sim \chi^2(n-1)$$

拒绝域：$\chi^2 \geqslant \chi^2_\alpha(n-1)$

$\chi^2_\alpha(n-1) = \chi^2_{0.05}(8) = 15.5078$

$15.68 > 15.5078$,

则拒绝 $\sigma^2 \leq \sigma_0^2$,

则可以认为这批导线的标准差显著地增大。

14. 检验假设：$H_0: \mu_1 - \mu_2 \leq 2$，$H_1: \mu_1 - \mu_2 > 2$

$$t = \frac{\bar{x} - \bar{y} - (\mu_1 - \mu_2)}{S_w\sqrt{\frac{1}{n_1} + \frac{1}{n_2}}}, \quad S_w = \sqrt{\frac{(n_1-1)S_{n_1}^2 + (n_2-1)S_{n_2}^2}{n_1+n_2-2}}$$

拒绝域 $t \geqslant t_\alpha(n_1+n_2-2)$

$t_\alpha(n_1+n_2-2) = 1.7171$

$t = 4.362 > 1.7171$

则拒绝 H_0，则 $\mu_1 - \mu_2 > 2$

扫描全能王 创建

15. 检验假设 $H_0: \sigma_1^2 < \sigma_2^2$, $H_1: \sigma_1^2 \geq \sigma_2^2$.

$$F = \frac{\sigma_2^2 S_{1n_1}^2}{\sigma_1^2 S_{2n_2}} \sim F(n_1-1, n_2-1)$$

$$F = \frac{0.245}{0.357} = 0.6863$$

拒绝域 $F \geq F_\alpha(5,8) = F_{0.05}(5,8) = 3.69$

由于 $F = 0.6863 < 3.69 = F_{0.05}(5,8)$

则 接受 H_0

则 可认为甲比乙精密。

20. ~~45.9-101.9~~ 假设有效. $H_0: \mu < 0$. $H_1: \mu \geq 0$

令 $z_i = y_i - x_i$

$$t = \frac{\bar{z} - 0}{\frac{S_z}{\sqrt{n}}}$$ 拒绝域 $\frac{\bar{z}}{\frac{S_z}{\sqrt{n}}} > t_\alpha(n-1)$

则 接受 H_0,

则 检验该药有效。

22. 检验假设

H_0: X 服从泊松分布 $P(\lambda)$

$$\hat{\lambda} = \overline{x} = \frac{1}{n}\sum_{i=1}^{n} x_i = 3.87$$

$$P(X=k) = \frac{\lambda^k}{k!} e^{-\lambda}$$

$$\chi^2 = \sum_{i=1}^{11} \frac{(n_{x_i} - n \times P(X=i))^2}{n \times P(X=i)} = 11.39$$

$$\chi^2_{0.05}(11-1-1) = \chi^2_{0.05}(9) = 16.9$$

$$\chi^2 < \chi^2_{0.05}(9)$$

∴ 可认为服从泊松分布。