

$$3. H_0: \mu \geq 10100 \quad H_1: \mu < 10100$$

$$U = \frac{\bar{X} - \mu_0}{\sigma / \sqrt{n}} \stackrel{H_0: \mu_0 = 10100}{\sim} N(0, 1)$$

$$W = \{U < -U_{\alpha}\}, \quad -U_{0.05} = -1.65$$

$$\text{代入: } \hat{U} = \frac{10000 - 10100}{40 / \sqrt{100}} = -25 < -1.65 \text{ 落在拒绝域}$$

接受 H_1 , 认为显著不合格

$$5. H_0: \mu \geq 0.5\%, \quad H_1: \mu < 0.5\%$$

$$T = \frac{\bar{X} - \mu_0}{s / \sqrt{n}} \stackrel{H_0: \mu_0 = 0.5\%}{\sim} t(n-1)$$

$$W: \{T < -t_{\alpha}(n-1)\}, \quad -t_{\alpha}(n-1) = -t_{0.05}(9) = -1.833$$

$$\frac{0.452 - 0.5}{0.037 / \sqrt{10}} = -4.102 < -1.833 \text{ 在拒绝域}$$

接受 H_1 , 能认为显著小于

$$6. H_0: \mu \leq 19400, \quad H_1: \mu > 19400$$

$$T = \frac{\bar{X} - \mu_0}{s / \sqrt{n}} \stackrel{H_0: \mu_0 = 19400}{\sim} t(n-1)$$

$$W: \{T > t_{\alpha}(n-1)\}, \quad t_{0.05}(35) = 1.609$$

$$T = \frac{20100 - 19400}{\sqrt{195600} / \sqrt{36}} = 9.497 > 1.609 \text{ 在拒绝域}$$

接受 H_1 , 认为显著上涨

$$7. (1) \bar{X} = 61.56, \quad s^2 = 71.03$$

$$\chi^2 = \frac{\sum (x_i - \mu)^2}{\sigma_0^2} \stackrel{H_0: \sigma_0^2 = 48}{\sim} \chi^2(n)$$

$$W = \{\chi^2 > \chi_{\alpha}^2(n)\}, \quad \chi_{0.05}^2(9) = 16.919$$

代入数据: $\chi^2 = 12.31 < 16.919$, 不在拒绝域, 接受 H_0 , 不显著大于 48

$$(2) \chi^2 = \frac{(n-1)s^2}{\sigma_0^2} \stackrel{H_0: \sigma_0^2 = 48}{\sim} \chi^2(n-1), \quad W: \{\chi^2 > \chi_{\alpha}^2(n-1)\}, \quad \chi_{0.05}^2(8) = 15.507$$

$$\chi^2 = \frac{8 \times 71.03}{48} = 11.83 < 15.507, \text{ 不在拒绝域, 接受 } H_0$$

不显著大于 48