(1.)

1. 常態分佈函數 $e^{-\frac{1}{2}z^2}\cdot\frac{1}{\sqrt{2\pi}}$

2. 卡方分佈 函數 $f(x)=e^{\frac{1}{2}\nu-1}\times e^{-\frac{x}{2}}\times\frac{1}{\Gamma(\frac{1}{2}\nu)}\times\frac{1}{2^{\frac{1}{2}\nu}}$

3. 卡方分佈

4. f 分佈 → $\begin{cases}\frac{\Gamma[(\nu_1+\nu_2)/2](\nu_1/\nu_2)^{(\nu_1/2)}}{\Gamma(\nu_1/2)\Gamma(\nu_2/2)}\frac{f^{(\nu_1/2)-1}}{(1+\nu_1 f/\nu_2)^{(\nu_1+\nu_2)/2}} & f>0\\ 0, & f<0\end{cases}$

5. t 分佈 → $\frac{\Gamma[(\nu+1)/2]}{\Gamma(\nu+2)\sqrt{\pi\nu}}\left(1+\frac{t^2}{\nu}\right)^{-(\nu+1)/2}\quad -\infty<t<\infty$

6. t 分佈 → $\frac{\Gamma[(\nu+1)/2]}{\Gamma(\nu+2)\sqrt{\pi\nu}}\left(1+\frac{t^2}{\nu}\right)\quad -\infty<t<\infty$

(2.)

(a.) $M=0\ \sigma=1$

prob= st.norm.cdf(x=1) = 0.8413447460685

(b.) $M=1\ \sigma=2$

$x_2=S_2*(n-1)/\sigma^{**}2$ 、st.chiz.cdf(x_2, df=2) = 0.9999999838

(c.) $\sigma=2\ M=1$

$x_2=S_2*(n-1)/\sigma^{**}2$ 、st.chiz.cdf(x_2, df=2) = 0.9999999983

(d.) V=1, tα=1

α = St.t.cdf(x=tα, df=V) = 0.75000000000002

(3)

(a.) $\frac{64-65}{3}=-0.33$

$P(\bar{x}_{\text{日}}\le 64)=P(z\le -0.33)=37.07\%$ #

(b.) $\frac{-0.01}{\frac{0.03}{\sqrt{25}}}=-1.67$ $P(z\le 1.67)=0.0475$ #

(c.) $\frac{x-65}{0.006}=-1.645$ $x=64.013\%$

(d.) $1.645=\frac{(65+d)-65}{0.006}$ $d=0.00987$

$(x_1, x_2)=(-0.987\%, +.987\%)$

背面

(e.) $V = 2 \quad t_\alpha = 1$

$\alpha = $ st.t.cdf (x = tα, df = V) = 0.7886751345948129

(f.) $V = 2 \quad t_\alpha$

$\alpha^2 = $ st.t.cdf (x = t_α, df = V)**2 = 0.6220084679
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