Hw6 key

M483

(7.2) for p: $\hat{p} \pm z_{\alpha/2}\sqrt{\frac{\hat{p}(1-\hat{p})}{n}}$ (note that for Bernoulli, $\bar{X}_n = \hat{p}$, $\bar{Y}_n = \hat{q}$)

(for 90% C.I, $z_{\alpha/2} = 1.645$)

for $p-q$: $(\hat{p}-\hat{q}) \pm z_{\alpha/2}\underbrace{\sqrt{\frac{\hat{p}(1-\hat{p})}{n} + \frac{\hat{q}(1-\hat{q})}{m}}}_{\widehat{se}(\hat{p}-\hat{q})}$

(7.6) $\hat{\theta} = \hat{F}_n(b) - \hat{F}_n(a) =$ proportion of observ. between a and b;

$se(\hat{\theta}) = \left[\frac{(F(b)-F(a))(1-F(b)+F(a))}{n}\right]^{1/2}$, $\widehat{se}(\hat{\theta})$: same, with $F(b), F(a)$ replaced by $\hat{F}_n(b), \hat{F}_n(a)$

or $\widehat{se}(\hat{\theta}) = \sqrt{\frac{\hat{\theta}(1-\hat{\theta})}{n}}$, just like for $\hat{p}$, problem 7.2

C.I.: $\hat{\theta} \pm z_{\alpha/2}\sqrt{\frac{\hat{\theta}(1-\hat{\theta})}{n}}$

(7.7) see Hw6Key.r ; 95% C.I. is $[0.495, 0.557]$

(A.) $\hat{\mu} = \bar{X}$, and $\widehat{se}(\bar{X}) = \sqrt{\frac{\sigma^2}{n}} \stackrel{\text{for Poisson, } \sigma^2 = \mu}{=} \sqrt{\frac{\bar{X}}{n}}$

$\Rightarrow$ 95% C.I. is $2.87 \pm 1.96\sqrt{\frac{2.87}{100}}$,

or $2.87 \pm .27$, or $[2.60, 3.14]$

(B.) see Hw6Key.r ; Normal CDF falls out of the confidence band around $x = 0.3$