HWK solutions to 3-23-17 on confidence intervals

1) given interval notation (6.5, 13.9)

$$p = \frac{6.5+13.9}{2} = 10.2 \qquad E = \frac{13.9-6.5}{2} = 3.7$$

Conjunction Notation $6.5 < p < 13.9$

Tolerance Notation 10.2 ± 3.7

2) given confidence notation $17.9 < p < 21.7$

$$p = \frac{17.9+21.7}{2} = 19.8 \qquad E = \frac{21.7-17.9}{2} = 1.9$$

Interval Notation (17.9, 21.7)

Tolerance Notation 19.8 ± 1.9

3) given $p = 21.75$ $E = 0.52$

Interval Notation $(21.75-0.52, 21.75+0.52)$

$(21.23, 22.27)$

Conjunction Notation $21.23 < p < 22.27$

Tolerance Notation 21.75 ± 0.52

4) given Tolerance Notation 35.8 ± 5.6

$p = 35.8$ $E = 5.6$

Interval Notation $(35.8-5.6, 35.8+5.6)$

$(30.2, 41.4)$

Conjunction Notation $30.2 < p < 41.4$

HWK solutions to 3-23-17 on confidence intervals

5) n = 75 x = 24 $p=\frac{24}{75.} = 0.32$ $q = 1-0.32 = 0.68$

CL = 99% Famous CV = $\text{invNorm}(0.005,0,1)$ ▸ -2.57583 CV = 2.575

$E = 2.575\cdot\sqrt{\frac{0.32\cdot 0.68}{75}}$ ▸ 0.1387

interval notation $(0.32-0.139, 0.32+0.139)$

$(0.181, 0.459)$

conjunction notation $0.181<p<0.459$

tolerance notation 0.32 ± 0.139

HWK solutions to 3-23-17 on confidence intervals

6) n = 99 x = 36 $p=\frac{36}{99.}$ $q = 1-0.364 = 0.636$

CL = 90% Famous CV = $\text{invNorm}(0.05,0,1)$ ▸ -1.64485 CV = 1.645

$E = 1.645\cdot\sqrt{\frac{0.364\cdot 0.636}{99}}$ ▸ 0.079548

interval notation $(0.364-0.08, 0.364+0.08)$

$(0.284, 0.444)$

conjunction notation $0.284<p<0.444$

tolerance notation 0.364 ± 0.080

6 number 2) n = 200 x = 59 $p=\frac{59}{200.} = 0.295$ $q = 1-0.295 = 0.705$

CL = 95% Famous CV = $\text{invNorm}(0.025,0,1) \blacktriangleright -1.95996$ CV = 1.96

$$E = 1.96\cdot\sqrt{\frac{0.295\cdot 0.705}{200}} \blacktriangleright 0.063204$$

interval notation $(0.295-0.063,\ 0.295+0.063)$

$(0.232,\ 0.358)$

conjunction notation $0.232<p<0.358$

tolerance notation 0.295 ± 0.063

7) n = 80 x = 71 $p=\frac{71}{80.}$ $q = 1-0.888$

CL = 76% NOT Famous ALPHA $1-0.76 = 0.24$ 1/2 alpha $= 0.12$

$CV = \text{invNorm}(0.12,0,1)$ CV = 1.175

$E = 1.175 \cdot \sqrt{\frac{0.888 \cdot 0.112}{80}} \blacktriangleright 0.041429$

interval notation $(0.888-0.041\ ,\ 0.888+0.041\ )$

$(0.847\ ,\ 0.929\ )$

conjunction notation $0.847<p<0.929$

tolerance notation 0.888 ± 0.041

9 n = 400 x = 35 $p = \frac{35}{400.} = 0.0875$ $q = 1 - 0.0875 = 0.9125$

CL = 68% NOT Famous ALPHA = $1 - 0.68$ ▸ 0.32 1/2 ALPHA 0.16

CV = $\text{invNorm}(0.16, 0, 1)$ ▸ -0.994458 CV = 0.994

$E = 0.994 \cdot \sqrt{\frac{0.0875 \cdot 0.9125}{400}}$ ▸ 0.014044

interval notation $(0.0875 - 0.014, 0.0875 + 0.014)$

$(0.0735, 0.1015)$

conjunction notation $0.0735 < p < 0.1015$

tolerance notation 0.0875 ± 0.1015

10) n = 200 x = 46 $p=\frac{46}{200.} = 0.23$ $q = 1-0.23 = 0.77$

CL = 53% NOT Famous ALPHA $1-0.53 = 0.47$ 1/2 alpha $=0.235$

$CV = \text{invNorm}(0.235,0,1) \blacktriangleright -0.722479$ CV = 0.722

$E = 0.722 \cdot \sqrt{\frac{0.23 \cdot 0.77}{200.}} \blacktriangleright 0.021485$

interval notation $(0.23-0.021, 0.888+0.041)$

$(0.209, 0.251)$

conjunction notation $0.209<p<0.251$

tolerance notation 0.23 ± 0.021