Solutions to HWK 3−27−17 Applications to Confidence Intervals

2a) p= $\frac{295}{325.}$ ▸ 0.907692 this implies q = $1-\frac{295}{325.}$ ▸ 0.092308

2b) 90% confidence interval has Critical Value of 1.645

E = $1.645\cdot\sqrt{\frac{0.9077\cdot 0.0923}{325}}$ ▸ 0.026412

So the confidence interval is 0.9077±0.0264

2c) 95% confidence interval has Critical Value of 1.96

E = $1.96\cdot\sqrt{\frac{0.9077\cdot 0.0923}{325}}$ ▸ 0.031469

So the confidence interval is 0.9077±0.0315

2d) 99% confidence interval has Critical Value of 2.575

E = $2.575\cdot\sqrt{\frac{0.9077\cdot 0.0923}{325}}$ ▸ 0.041344

So the confidence interval is 0.9077±0.0413

$$n = \frac{CV^2(pq)}{E^2}$$

3) CL = 0.95 p = 0.65 q = 1−0.65 = 0.35 E = 0.020 CV =1.96

$$n = \frac{(1.96)^2 \cdot 0.65 \cdot 0.35}{(0.02)^2} \blacktriangleright 2184.91$$ ROUND UP TO 2185

4) CL = 0.90 p = 0.56 q = 1−0.56 = 0.44 E = 0.03 CV =1.645

$$n = \frac{(1.645)^2 \cdot 0.56 \cdot 0.44}{(0.03)^2} \blacktriangleright 740.85$$ ROUND UP TO 741

5) n =2100 p =0.56 q = 1−0.56 = 0.44

5a) 90% confidence interval has Critical Value of 1.645

E $= 1.645 \cdot \sqrt{\frac{0.56 \cdot 0.44}{2100}} \blacktriangleright 0.017819$

So the confidence interval is 0.56±0.018

5b) 95% confidence interval has Critical Value of 1.96

E $= 1.96 \cdot \sqrt{\frac{0.56 \cdot 0.44}{2100}} \blacktriangleright 0.021231$

So the confidence interval is 0.56±0.018

5c) 99% confidence interval has Critical Value of 2.575

E $= 2.575 \cdot \sqrt{\frac{0.56 \cdot 0.44}{2100}} \blacktriangleright 0.027893$

So the confidence interval is 0.56±0.018

$$n = \frac{CV^2(0.25)}{E^2}$$

6a) CL = 0.90 p = ??? E = 0.03 CV =1.645

$$n = \frac{(1.645)^2 \cdot 0.25}{(0.03)^2} \blacktriangleright 751.674$$ ROUND UP TO 752

6b) CL = 0.95 p = ??? E = 0.05 CV =1.96

$$n = \frac{(1.96)^2 \cdot 0.25}{(0.05)^2} \blacktriangleright 384.16$$ ROUND UP TO 385

6c) CL = 0.99 p = ??? E = 0.07 CV =2.575

$$n = \frac{(2.575)^2 \cdot 0.25}{(0.07)^2} \blacktriangleright 338.297$$ ROUND UP TO 339