

## Homework #7

Due 11:59pm (Section 2/Section 3) April 19<sup>th</sup>, 2019

Please follow the name convention to name your **folders and files**: **CC\_<lastName>\_HW<#>.pdf**. **Your HW will not be graded if you do not follow this name convention.** And electronically submit your HW to **cv094021@gmail.com**

### Pages 335-336: 6 (b), (c), (d)

(b)  $\bar{X} = 136.9$ ,  $s = 22.6$ ,  $n = 123$ ,  $z_{.0025} = 2.81$ .

The confidence interval is  $136.9 \pm 2.81(22.6/\sqrt{123})$ , or  $(131.17, 142.63)$ .

(c)  $\bar{X} = 136.9$ ,  $s = 22.6$ ,  $n = 123$ , so the upper confidence bound 139.9 satisfies  $139.9 = 136.9 + z_{\alpha/2}(22.6/\sqrt{123})$ .

Solving for  $z_{\alpha/2}$  yields  $z_{\alpha/2} = 1.47$ .

The area to the right of  $z = 1.47$  is  $1 - 0.9292 = 0.0708$ , so  $\alpha/2 = 0.0708$ .

The level is  $1 - \alpha = 1 - 2(0.0708) = 0.8584$ , or 85.84%.

(d)  $z_{.025} = 1.96$ .  $1.96(22.6/\sqrt{n}) = 3$ , so  $n = 219$ .

### Pages 342- : 4 (a), (c), (e)

(a)  $\bar{X} = 170$ ,  $n = 444$ ,  $\tilde{p} = (170 + 2)/(444 + 4) = 0.38393$ ,  $z_{.025} = 1.96$ .

The confidence interval is  $0.38393 \pm 1.96\sqrt{0.38393(1 - 0.38393)/(444 + 4)}$ , or  $(0.3839, 0.4290)$ .

(c) The upper confidence bound 0.40 satisfies the equation  $0.40 = 0.38393 + z_{\alpha}\sqrt{0.38393(1 - 0.38393)/(444 + 4)}$

Solving for  $z_{\alpha}$  yields  $z_{\alpha} = 0.70$ . The area to the left of  $z = 0.70$  is  $1 - \alpha = 0.7580$ .

The level is 0.7580, or 75.80%.

(e) Let  $n$  be the required sample size.

Then  $n$  satisfies the equation  $0.03 = 2.58\sqrt{\tilde{p}(1 - \tilde{p})/(n + 4)}$ .

Replacing  $\tilde{p}$  with 0.38393 and solving for  $n$  yields  $n = 1746$ .

### Pages 353: 8(a), 8(c)

(a)  $\bar{X} = 3410.14$ ,  $s = 1.018$ ,  $n = 8$ ,  $t_{8-1,.025} = 2.365$ .

The confidence interval is  $3410.14 \pm 2.365(1.018/\sqrt{8})$ , or  $(3409.3, 3411.0)$ .

(c) No, the value 3412.66 is an outlier.