

**Introduction to Statistics and Biostatistics: Practice Exercises for Sec. 8.1**

Name: \_\_\_\_\_

**Instructions:** Read each question carefully before determining the best answer. For numerical answers, report all final numerical values to a precision of 4 units past the decimal point.

**SHOW ALL YOUR WORK;** do not rely on a computer output to satisfy the answer.

1. In each of the following circumstances with  $X \sim B(n,p)$ , state whether or not you may use the plus-four/Agresti-Coull confidence interval for estimating an unknown  $p$ .

a.  $n = 70, X = 50$

Yes ☐

No ☐

b.  $n = 80, X = 15$

Yes ☐

No ☐

c.  $n = 10, X = 5$

Yes ☐

No ☐

d.  $n = 60, X = 50$

Yes ☐

No ☐

e.  $n = 20, X = 15$

Yes ☐

No ☐

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2. Gambling is an issue of great concern to those involved in intercollegiate athletics. Because of this concern, the National Collegiate Athletic Association (NCAA) surveyed student-athletes concerning their gambling-related behaviors. They found that 1337 out of a total of 3381 female student-athletes reported participation in some gambling activity. Employ the plus-four/Agresti-Coull confidence interval to estimate the true proportion with a 95% confidence interval. (Use the space below to show your work.)

Lower limit: \_\_\_\_\_

Upper limit \_\_\_\_\_

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3. A survey of 1300 student loan borrowers found that 444 had loans totaling more than \$20,000 for their undergraduate education. Give a 90% plus-four/Agresti-Coull confidence interval for the proportion of all student loan borrowers who have loans of \$20,000 or more for their undergraduate education. (Use the space below to show your work.)

Lower limit: \_\_\_\_\_

Upper limit \_\_\_\_\_

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4. In a study of the relationship between pet ownership and physical activity in older adults, 615 subjects reported that they owned a pet, while 1942 reported that they did not. Give a plus-four/Agresti-Coull 90% confidence interval for the proportion of older adults in this population who are pet owners. (Use the space below to show your work.)

Lower limit: \_\_\_\_\_

Upper limit \_\_\_\_\_

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5. Many people die in bicycle accidents each year. One study examined the records of 1911 bicyclists aged 15 or older who were fatally injured in bicycle accidents in a five-year period, who also had their blood alcohol concentrations recorded. In this study 390 bicyclists had blood alcohol levels above 0.10%, a level defining legally drunk at the time. Give a plus-four/Agresti-Coull 99% confidence interval for the underlying true proportion who were legally drunk according to this criterion. (Use the space below to show your work.)

Lower limit: \_\_\_\_\_

Upper limit \_\_\_\_\_