SRiS - Chapter 11 (Practice) Exam

1. To estimate the number of students at a high school who would be interested in starting a rugby club that would practice after school, 50 students were surveyed as they were waiting for track and field practice right after school. Of these students, 4% responded in favor of a rugby club.

   (a) Identify the population and the sample.

   (b) What type of sampling was used? Explain your reasoning.

   (c) Explain why this sampling method is biased. Do you think the percentage of all students who would be interested in starting a rugby club is greater than or less than 4%? Explain your reasoning.

   (d) How would a random sample of students help avoid the bias described in part (c)? Why is this important?

2. What percentage of soccer players have faked being injured during a game? To find out, league officials will randomly select 40 of the 480 active MLS players and interview them by e-mail. Of these 40 players, suppose that 5% admitted that they had faked an injury during a game.

   (a) Explain how to use a random number generator to select a random sample of 40 players from this population.

   (b) Do you think that the percentage of all soccer players who have faked being injured during a game is less than, greater than, or about the same as 5%? Explain your reasoning.

3. In 2017, Fieldhouse Media surveyed a random sample of 2087 student athletes at colleges and universities in the United States about their use of social media, and 397/2087 = 19.0% said they have checked social media during one of their games.

   (a) Do you think that exactly 19.0% of all U.S. collegiate student athletes have checked social media during one of their games? Explain your reasoning.

   (b) Using the applet, the estimate of the standard error of the estimated percentage is 0.9%. Interpret the standard error.

   (c) Use the standard error from part (b) to calculate and interpret a 95% confidence interval for the percentage of all U.S. collegiate student athletes who have checked social media during one of their games.

(d) Based on the confidence interval from part (c), is there convincing evidence that more than one quarter of all U.S. collegiate student athletes would agree that they have checked social media during one of their games? Explain your reasoning.

(e) Explain how the survey could reduce the margin of error for their estimate. Does your suggestion have any drawbacks? Explain your reasoning.

4. In the 2017-2018 season, basketball player James Harden won the Most Valuable Player award and made 265 out of 722 3-point shot attempts, for a shooting percentage of 36.7%.

(a) Was 36.7% Harden's *PERFORMANCE* or his *ABILITY* to make a 3-point shot? Explain your reasoning.

(b) In 10,000 simulated seasons, the standard error of Harden's 3-point shooting percentage is 1.8%. Use the standard error to calculate and interpret a 95% confidence interval for Harden's *ABILITY* to make a 3-point shot during the 2017-2018 season.

(c) Is there convincing evidence that Harden's *ABILITY* to make a 3-point shot was greater than 35% during the 2017-2018 season? Explain your reasoning.

5. In the 2018 season, golfer Dustin Johnson led the PGA Tour in scoring average. In 77 rounds of golf his average score was 68.7 strokes.

(a) Do you think Johnson's *ABILITY* to score was exactly 68.7 strokes during the 2018 season? Explain your reasoning.

(b) Using the applet, the estimate of the standard error of the estimated mean is 0.35 strokes. Interpret the standard error.

(c) Calculate and interpret a 95% confidence interval for Johnson's *ABILITY* to score in the 2018 season.

Based on your interval, is it plausible that his *ABILITY* to score was more than 69 strokes during the 2018 season? Explain your reasoning.