STAT:1020 discussion - week 14

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Chap. 13

Problem 1. Case of known p

A random sample of 60 is drawn from a population having $p = 0.7$.

1. What is the distribution that the sample proportion follows?
2. What is the expected value (mean) for the sampling distribution of the proportion?
3. What is the standard deviation for the sampling distribution of the proportion?
4. What is the chance that the sample proportion is greater than 0.8?

Problem 2. Case of unknown p

In the Spring of 2019, 45% of a random sample of 402 adult Iowa residents said they thought they are good at playing tennis.

1. What is the standard error for the sampling proportion?
2. What is the margin of error for the proportion of all adult Iowa residents who think they are good at playing tennis with 90% confidence?
3. Explain what this margin of error means.

   We are 90% confident that the observed proportion of adults who are good at tennis is within ____ of the population proportion.

4. What is a 90% confidence interval for the proportion of adult Iowa residents who think they are good at playing tennis?

5. How do you interpret the C.I. you have from the above?

   We are ___ % confident that, if we ask ALL adult Iowa residents whether they are good at tennis, between ___ % and ____ % of them would say they are good at tennis.

Problem 3.

Random people of 60 are sampled from a population for the survey to figure out the divorce rate p in Iowa. Survey shows 20 people said that they have divorced before.

What is a 95% confidence interval for the proportion of the divoerce rate in Iowa?

Problem 4. Sample size

A credit card company is about to send out a mailing to test the market for a new credit card. From that sample, they want to estimate the true proportion of people who will sign up for the card nationwide. a pilot study suggests that about 5% of the people receiving the offer will accept it. To be within an one percentage point of the true rate with 95% confidence, how big does the test mailing have to be?

To solve this question, it will help you to solve these questions.

1. What is $\hat{p}$?
2. Which value that we should use for the margin of error?
3. Look up the formular sheet, try to set up the equation.