Stat 200 Lab 8

Activity 1
For this activity, you'll work in pairs to do an ESP experiment. Find a lab partner! Use Minitab to generate a random sequence in which each item is either a "1" or a "2." To do this, click Calc>Random Data>Integers. Fill in the dialog box so that you Generate 25 rows into a column (like C1) with minimum value=1 and maximum value=2.

Write down you sequence into the following table. DON'T LET PEOPLE AROUND YOU SEE THE SEQUENCE!

Have your partner guess each item in the sequence. During each guess, look at each item and concentrate on what the number is. In ESP experiments, one person "sends" and the other person "receives." Keep track of how many correct guesses your partner makes. Then, switch roles so that you attempt to guess your partner's list.

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How many items did your partner guess? ________

What was his/her sample proportion of correct guesses out of the 25 trials? ______

If a person is merely guessing, what's the "true" probability of correct guess at any item?

For 25 trials, calculate the standard deviation of the possible sample proportions of correct guesses.

\[
\sqrt{\frac{p(1-p)}{n}} =
\]

What do you think would be an very good result (prop. of correct guesses) for an individual? How would you figure out the probability that somebody guessing could do this well?
In this area, we'll work out some things to do with the overall class result for the ESP experiment. During the discussion, we'll determine the proportion of correct guesses for the whole class and then see if it's unusually high or low.

Activity 2
The birthday problem is - If "n" people are in a group, what is the probability that at least two of them have the same birthday (month and day only).

Simulate the birthdays for a sample of 25 people. Use the integers 1 to 365 to represent days of the year. (what about Feb. 29!?) Use Calc>Random Data>Integers to generate 25 numbers between 1 and 365. Then, use Stat>Tables>Tally to look at the distribution of numbers. From the tally, you can tell if a birthday occurred twice.

Repeat the simulation of n=25 four times. In how many of the four simulations, was there at least one match?

Do four simulations for n=50. How many of the four simulations included at least one match?

If we assume all birth months are equally likely, the probability a randomly selected individual is born in one of the months January, February, or March is \( p = \frac{3}{12} = \frac{1}{4} \). Suppose that we find the sample proportion born in these months for a sample of n=50. Determine the characteristics of the normal curve that approximates the possibilities.

In this area, we'll do a calculation based on our class data. We'll see if the sample proportion with birthdays in Jan., Feb. or March is consistent with \( p = \frac{1}{4} \).