Project #1 for RINS ending in 8 or 9

Note there are 3(individual) or 4(partner) parts to this project.

Please put the project number/title, your name(s) and last 4 of (both) RIN number(s) on the cover sheet of your project. This assignment should be typed (you may leave some space for NEATLY hand-drawn figures and/or calculations). Keep in mind that your project will be checked for grammar and spelling (you may want to consider bringing your final project to the Center for Communication Practices located in Folsom Library, Lower Level 154A and 154B).

Part 1 – Probability

Experiment description: Roll two six-sided die. To distinguish the two die, we will consider one to be white and the other one red.

Calculate the following probabilities making sure to state whether or not order matters in each case. Include your calculations and an explanation of your work.

a) List all possible outcomes if order matters. List all possible outcomes if order does not matter.
b) \( P(\text{sum of both dice is } 9) \)
c) \( P(\text{white die is greater than red die}) \)
d) \( P(\text{both die display the same number}) \)
e) \( P(\text{at least one die is less than } 3) \)

Do the experiment 50 times and record your results. Write 3 – 5 sentences describing your results. Include in this description anything unexpected along with a comparison of your results with the probabilities you calculated above in parts (b) and (d).

Part 2 – Statistics

Experiment description: Ask at least 75 people what their birth month is. Record your results in two categories: responses from males and responses from females. Use the numbers 1 – 12 to denote each month of the year.

a) Create a histogram and frequency polygon for each of your categories.
b) Calculate the mean, median, mode and midrange for males. Calculate the mean, median, mode and midrange for females. Calculate the mean, median, mode and midrange for males and females combined.
c) Make a frequency chart for males and calculate the quartiles of the data (refer to http://en.wikipedia.org/wiki/Quartile for a description of quartiles.) Repeat for females.
d) Calculate the standard deviation for each population listed in b). Make sure to show all your work.
e) Are the results of your observations for birth months a good sample of the true population of birth months? Write 2 – 4 sentences describing why or why not.
f) If the President of Cold Stone Creamery asked you to present these results to them about what months contain more birthdays, how would you present this information? Is this good information to present to them? What kind of sampling are your results for this study? Write 5-7 sentences describing your sample.
Part 3 – On Your Own

Experiment description: Come up with your own Opinion Poll Question (yes or no type question) and ask at least 75 people. Examples of Opinion Poll questions are (do not use these, make up your own!):

- Do you prefer Coke or Pepsi?
- Are you a Republican?
- Do you have a meal plan?
- Are you rooting for the Steelers in the Super Bowl?

a) Find the margin of error for your poll at the 95 % confidence level (as in section 12.4).

b) How many people should you poll to have a margin of error of 4.0 % at the 95 % confidence level? Is this realistic? Explain your findings.

c) What information can you pull from this survey? Write 2-3 sentences.

d) Write 5-7 sentences about how you would present this information to a person of importance with relevance to your topic. (i.e. President of Coke for the first sample question) Who is your person of importance?

e) If you were the person you would present this information to (i.e. President of Coke), what other kind of information would you want and why? Write 3-5 sentences.

Part 4 – For project submissions that are done with a partner

- Repeat Part 3 of the project with second Opinion Poll question that concerns a different subject and make the following changes in the calculations:
  - For a), find the margin of error for a 95% confidence interval.
  - For b), find the number of people to poll to get a 2.9% margin of error at a 95% confidence interval
  - Complete parts c) – e) as given.

- Please write a short (1/2 page) evaluation of your partner. Describe both your partner’s and your own efforts and contributions to the project. How would you grade yourself on a 100 point scale? How would you grade your partner?

These evaluations need to be handed in individually. Please give your evaluation to your TA (Raj) in recitation or in his mailbox in Amos Eaton 301 by the project due date.