Problem set 2

Online S520

Upload your answers through the Assignments tab on Canvas

1. (10 points) Trosset chapter 3.7 exercise 7.

   (Note: You can draw the Venn diagram by hand, scan it and include in your homework document.)

2. (4 points) A statistics class contains 35 students: 11 undergrads and 24 grad students. Of the undergraduates, 4 are female and 7 and male. Of the grad students, 5 are female and 19 are male.

   (a) I randomly select a student from the class. Given that the student I select is a male, what is the conditional probability that they are an undergraduate?

   (b) I randomly select *two* students from the class, without replacement, in order. Given that the first student I select is a grad student, what is the conditional probability the second student I select is an undergraduate?

3. (3 points) Trosset chapter 3.7 exercise 12, parts (e) to (g).

4. (10 points) Let X be a random variable with CDF

$$F(y) = \begin{cases} 0 & y < -2 \\ (y+2)/4 & -2 \le y < 2 \\ 1 & y \ge 2 \end{cases}.$$

   Graph F and compute the following probabilities:

   (a) What's $P(X \le 1)$?

   (b) What's $P(X > 1)$?

   (c) What's $P(X \ge 1)$?

   (d) What's $P(-1.5 < X < 0.5)$?

   (e) What's $P(|X| > 1)$?

   (Hint: Refer to the lecture notes if you are not sure about the probability of X taking on a single value.)

5. (3 points) R tutorial and exercise: R Is a Calculator!

   (a) In R/RStudio, enter the following command with your name.

```
> print("Jianyu Wang's R examples:")
[1] "Jianyu Wang's R examples:"
```

   (b) Create two vectors and choose at least 10 operations/functions from the list of examples on Trosset p. 440.

   (c) Take a screenshot of all the R outputs.

   (d) Submit the picture with the other homework problems.