Due: Monday, October 4th (11:59 p.m. PT.)

References are to the course textbook (Ross, 12th edition), except as noted.

Notes

There will be no tutorial on Thursday, September 30th as it is a holiday.

The first midterm is on Friday, October 8th, and will cover the first 3 chapters.

Reading

For Wednesday, September 22nd, Sections 2.7 and 2.9.

For Friday, September 24th, Sections 3.1 and 3.2.

For Monday, September 27th, Section 3.3.

For Wednesday, September 29th, Section 3.4.

For Friday, October 1st, Section 3.5.

For Monday, October 4th, Sections 3.6 and 3.7.

This is fairly heavy reading, but you should have seen this material before in STAT 270. We will not cover Section 2.6 or 2.8. For Section 2.7, you should understand the statements of the theorems and how to apply them, the proofs are tangential to our goals.

Assignment exercises to hand in

1. For the next 3 class days (September 22nd, 24th and 27th) record the (earliest) time you **departed** your residence and the (earliest) time you **arrived** at campus on those days.[1]
2. Your departure and arrival times on future days can be modelled as a random process. Let X represent your departure time, and Y represent your arrival time. One way to do this would be to take the three times you found for each value and use a discrete random variable that returns one of those three variables with equal probability. Describe the joint probability mass function $p(x, y)$ you would get if:
   (a) You take both the departure time and arrival time at random from the 3 available choices.
   (b) You choose a day at random, and take both the departure and arrival time from that day.
3. Does (a) or (b) more sense for this model? Why?
4. For both (a) and (b), compute $E[Y|X = e]$ where e was your earliest observed departure time.
5. Compute $Cov(X, Y)$ for both (a) and (b), and deduce whether X and Y are independent.
6. A better model for your departure and arrival times might use a continuous random variables. Using the distributions mentioned in class, explain what you believe would be a good model for your departure time X and why. Include numerical values for any parameters in the model.
7. What does the random variable $Y - X$ represent? Should we expect that $Y - X$ is independent of X? Why or why not?

[1] If you live on campus, use the time you departed residence, and the time you arrived at class.

8. Chapter 2, Exercise 68.
9. Chapter 2, Exercise 77.
10. Chapter 3, Exercise 8.
11. Chapter 3, Exercise 10.
12. Chapter 3, Exercise 12.
13. Chapter 3, Exercise 14.
14. Chapter 3, Exercise 26.
15. Chapter 3, Exercise 31.

Some other exercises you should try

This textbook has many worthwhile exercises, you are encouraged to try as many as you can. Note, though, that a few are based on topics we did not cover, such as those mentioning "moment generating functions".