Finally!

Online Notes!

Good news! In order to help you on the exams, the TAs have decided to put their recitation notes all online! I haven’t gotten around to do this yet, but when I do, it’ll be on the webpage below:

http://www.andrew.cmu.edu/user/sangt/concepts-f11/recitations.html

Homework Feedback!

Problem 9.1 (the axiomatic proof)

- $P(A \cup B) = P(A) + P(B) - P(A \cap B)$ is not an axiom! We proved it in recitation a while ago, so it’s actually a theorem.

- A lot of you had the clever idea of using conditional probability, where you set $P(A|B) = \frac{P(A \cap B)}{P(B)} \leq 1$ and multiplied both sides by $P(B)$. If you did this, you made a very subtle error (I didn’t take off points for this). Your proof doesn’t work when $P(B) = 0$. This can happen in scenarios where unhappenable things exist in your sample space. For example, suppose you’re flipping a coin, and you decide that the sample space {$heads, tails, explosion$}, then if $B = \{explosion\}$, then $P(B) = 0$.

Problem 9.9 (the marble problem)

- A lot of you didn’t quantify your sample space and events! Don’t just assume that I know what you’re talking about. Please define your events always.

- A lot of you took for granted that some of your probability calculations are obvious, so you neglected to show your work. Unless you’re given the probability in the problem, please always justify your work.

- $P(A|B) = \frac{P(A \cap B)}{P(B)}$ is not Bayes’ theorem! It’s simply the definition of conditional probability.

Problem 9.18 (the smoking problem)

- Most people did well here. A lot of you made a similar mistake found in problem 9.9, but I didn’t take off points twice for the same thing.

Problem 9.29 (the couples problem)

- A lot of you thought that the probability of a male-female pair happening is 1/2. This is not true. Suppose $n = 1$, then the probability is clearly 1.

- Please always justify a step by “linearity of expectation” if you’re doing a linearity of expectation problem.

- Saying “$X_i = 1$ iff the $i$-th male is paired with a female” is not enough to define $X_i$. What value does $X_i$ have if the $i$-th male is not paired with a female? You need to explicitly tell me that $X_i = 0$ in those cases.

- The two events where two different males pair with a female are not independent events! However, this doesn’t matter for this problem. A beautiful thing about linearity of expectation is that it allows you to bypass examining independence under most circumstances.
Final Exam Reviews!

Below are some useful dates to remember:

- **SI tutoring:** Saturday, 12/10, 5-7pm in Cyert B6A and B6B by Natalie Morris
- **Review session:** Wednesday, 12/14, 6-8pm in Doherty 2210 by JD, Brendan, Adam
- **Walk-in tutoring:** Wednesday, 12/14, 8-10pm in UC Rangos 3 by Sanjeev Reddy and Stephen Tawa

I will also be holding office hours a lot prior to the exam (announced later). And if you ever want private help, always feel free to contact me 😊

Final Exam Info!

- 8 questions!
- 3 hours!
- You should be able to finish in 1.5 hours!
- Exam material: chapters 1-7, 9
- Not on exam: inclusion-exclusion, pigeonhole principle, Chinese remainder theorem, RSA cryptography
- Emphasized on exam: induction and probability (we’re expecting two induction problems and two probability problems)

Final Thoughts!

I really want to thank you all for being such great students this semester! It’s been really fun serving you, and I hope you all do well on the exam! I’m looking forward to serving you again next semester as the 251 TA for section E. Be excited!