Tentative homework assignments. Check for updates.

Math 530 (Probability and Statistics) Homework

From Casella and Berger; Statistical Inference, Second Edition

Ch.	Sec.	Exercise Numbers	Due date
1	1.1-1.2	**5, 6, 11c, 13, 18 [Assume that the balls are distinct], 23**	**Mon. 8/28**
	1.3	**24, 25, 26, 27, 33, 35, 37, 38, 42 (**You may consider proving this by induction, in place of the suggested method)	
	1.3	**Independence: 36, 39, 40**	**Mon 9/11**
	1.4-1.5	**47(b,c,e), 48, 49, 51** (plot not needed)	**Mon 9/11**
	1.6	**52, 53, 54, 55**	**Mon 9/11**
2	2.1	**1, 2, 3, 4, 6(a,c), 7a, 9**	**Mon 9/11**
	2.2	**11, 12, 13, 14, 15, 16, 17**	**Mon 9/11**
		18 (Write E(|X-a| in terms of integrals, and take derivative w.r.t. a and set equal to zero, and solve for a), **19, 20 (**Assume probability of having a daughter is p)	**Mon 9/11**
	2.3	**22, 23, 24(b), 26, 27(ab), 28,**	**Mon 9/11**
		25, 30 (a-c; Note that part (d) is problem 38a.**), 31(**Think about what an mgf should be at t=0**), 32, 33c, 34, 36, 38(**Note that Part (a) of this problem is the same as 30(d)**)**	**Mon 9/11**
3	3.1-3.2	**1, 2, 4, 5, 6, 7, 8, 12, 13, 14, 15**	**Mon 9/18**
	3.3	**17, 18, 19, 20, 22(d,e), 23, 24(c), 25, 26**	**Mon 9/18**
	3.4	**28(c,d,e)**	**Mon 9/18**
		29(c,d,e), 30b, 32, 33(b,d)	**Mon 9/25**
	3.5	**37, 39**	**Mon 9/25**
	3.6	**44, 45, 46, 48 (Binomial only). 49**	**Mon 9/25**
4	4.1	**1, 2(d), 4, 5(b)**	**Mon 10/9**
	4.2	**10, 11, 12, 13, 15**	**Mon 10/9**

	4.3	**14, 17**	**Mon 10/16**
		19, 20, 21, 23a, 24, 26, 28(a)	**Mon 10/16**
	4.4	**31, 32a, 36**	**Mon 10/16**
	4.5	**41, 42, 43, 44, 45, 47, 49, 50 only Corr(X,Y) (**use the conditional distribution on page 177, also the fourth central moment of N(mu,sig^2) is 3*sig^4.**), 51, 53, 54, 58,**	**Mon 10/16**
	4.6	**39**	**Mon 10/16**
5	5.1-5.2	**3, 4, 5, 8(a), 10 (Stein's Lemma can be useful in part a), 11 [**Use Jenson's inequality (Theorem 4.7.7) on page 190**]**	**Mon 10/23**
	5.3	**12, 15, 16, 17, 20(a)[**Use the characterization of the t distribution, where $Z \sim N(0,1)$ and $X \sim \chi^2(\nu)$ and $T = \frac{Z}{\sqrt{\frac{X}{\nu}}}$. Then compute the cdf of T, using the law of total probability. Representing the t distribution as a mixture has important applications in computing.**],**	**Mon 10/30**
	5.4	**21, 22, 24, 27(a)[**Consider two cases, one where i<j and one where i>j, and apply the definition of conditional pdf.**]**	**Mon 10/30**
	5.5	**29, 31, 32 (show part (a) directly)**	**Mon 10/30**
		34, 35, 36[Hint for Part (b): Write the mgf of $W = \frac{Y-EY}{\sqrt{Var(Y)}}$. Also it helps to reparametrize $\theta = \eta^2/2$, and let η approach infinity**], 42, 43a[**Start with $P(\lvert Y_n - \mu \rvert < \epsilon)$ and multiply both sides of the inequality by $\sqrt{n}$.**], 44 [**Use the theorems in Section 5.5**]**	**Mon 11/13**
6	6.2.2	**1, 2, 3, 6**	Skip
		9ab(use Theorem 6.2.13), 17 (apply Theorems 6.2.10 and 6.2.25)	Skip
7	7.1-7.2	**1, 4, 6, 8, 9, 10, 11, 13, 14**	**Mon 11/13**
	7.2	**23, 24**	**Mon 11/27**
	7.3	**19, 20**	**Mon 11/27**
		38 (Use Corollary 7.3.15) , 40, 41, 46(a,b,d), 61, 62	**Mon 11/27**
		37, 47, 49 , 44 (Apply Theorem 7.3.23),	**Skip**
8	8.1-8.3	**1, 2 (**Test $H_0: \lambda = 15, versus\ H_1: \lambda < 15$**), 3, 5(ab), 6**	**Mon 12/4**

		10 (Use R or Rguroo instead of chi-squared table), 12(use R, and sigma =1), 13(a,b,c), 14, 16, 17, 18	**Mon 12/4**
		19, 20, 22, 25, 31,37	**Skip**
		49	**Mon 12/4**
9		**3(Note** that $\frac{\widehat{\beta}}{\beta}$ is a pivot**), 4, 8, 12, 27**	**Wed 12/4**
		6a, 14, 27a	**Wed 12/4**
10		**1, 3, 9**	**Skip**