

## IEOR 3600: HMWK 10

1. Chapter 9:

Page 334; 87, 88, 91. (Goodness of fit  $\chi^2$  test.)

For 87: For degrees of freedom  $v = k - p - 1$ ,  $p = 1$  here since you must estimate  $\lambda$  from the data. Also (as you will see) you will have to combine the first two categories and then  $k = 7$ .

For 88: (Here, you will need to combine 5 – 8, and combine 12 – 15;  $k$  then comes down to  $k = 5$ .)

Chapter 10:

Page 371; 33. (Paired  $t$ - test, as in green(10-22) chart Page 367.)

2. A software company wishes to compare the speed at which its two packages  $S_1$  and  $S_2$  can solve a particular kind of difficult computational problem. They realize that different laptops might yield different speeds, so they randomly selected 100 new laptop computers (different companies), installed both packages on each, and then recorded how much time each one needed to complete the problem.  $\bar{X}_1(100) = 10.2$  minutes was the average for  $S_1$  and  $\bar{X}_2(100) = 9.1$  was the average for  $S_2$ . Thus the differences have mean  $\bar{D}(100) = 10.2 - 9.1 = 1.1$  The sample standard deviation of the differences was  $S_D(100) = 2.1$  At the 95% significance level, do a one-sided test  $H_0 : \mu_D = 0$  versus  $H_1 : \mu_D > 0$  to determine if  $S_2$  is faster than  $S_1$ .

Here, since  $n = 100$  you will use the normal distribution as opposed to the  $T$ .