Statistics II Practice Problems

Packet A

(Covers Chapters 4,7,8,9,12,and14)

1) We are rolling 2 dice. Define events A, B, C as follows:

A={Rolling one even and one odd}

B={Rolling a 2 and a 3}

C={Rolling a total of a 7}

Find:

a) P(A)
b) P(B)
c) P(C)
d) P(A and B)
e) P(B and C)
f) P(A and C)
g) P(not A)

[WRITE OUT THE SAMPLE SPACE! Hint: there will be 36 possibly combinations of two dice]

2) We are interested in probabilities of ACT scores. Say ACT scores are normally distributed with a mean of 26 and a variance of 16. Find:

a) $P(X<26)$

b) $P(X>26)$

c) $P(X>35)$

d) $P(X=36)$

e) $P(22<X<30)$

3) We wish to know the average amount of times Americans think about bacon in a month. We take a sample of 36 individuals and find that, on average, Americans think of bacon 18 times a month with a sample variance of 9.371. We think, however, that the true amount of times per month is 19.

a) Conduct a hypothesis test at $\alpha=.1$ level. What about $\alpha=.01$?
b) What is the p-value?
c) Create a 90% Confidence interval for the true mean value of bacon thoughts.

4. We are conducting a posthumous study to see the effects of years a person runs to how long they live, to see if running has any impact on the lifespan of a person. We collect the life lengths of 20 people and found how long they ran for before dying:

5	65
8	70
10	68
23	82
2	78
7	68
9	80
1	67
2	70
33	91
17	83
18	83
20	78
40	94
7	84
5	82
9	73
10	73
1	63
8	58

a) Given that X-bar=11.75 and Y-bar=75.5, Sy=9.500 and Sx=10.557 and r=0.912, find the regression equation
b) Given that that SSTO=1715 and SSG=935.45, complete the ANOVA table for regression.
c) Conduct the F test to see if $\beta=0$ or $\beta/=0$. Find F(.95) and compare it to the F* you calculated. What is your conclusion?

5. We are trying to compare 3 different stain removers to see if there is a mean difference between the stain removal based on a ten point scale (10 being the best remover). We test each brand 5 times resulting in the following results:

Brand A	Brand B	Brand C
5	4	8
3	3	5
2	3	6
7	5	7
5	6	6

Complete the ANOVA table and perform the F test to see if $\mu1=\mu2=\mu3$ or if at least one of the means are different. Write out the hypothesis and find all relevant values (SSE,SSG etc.). Do you reject or fail to reject?

6. I tell you that I am a physic and can predict coin flips. To test this we flip a coin 40 times and I predict 22 coins correctly. Do you think I am actually a physic? Perform a hypothesis test to test the hypothesis:

   Ho : p=.5

   Ha : p/=.5

At $\alpha=.05$

Create a 95 percent CI for p. Does the confidence interval for p support your conclusion?

7. I have a thought that the amount of slices of pizza Gainesville inhabitants eat from Leonardo's in a month is 7. I collect a sample of 17 people and find the average amount of pizza slices is 8.4 with a standard deviation of 2. Conduct a hypothesis test to see if the true mean value is above 7 at α=.05. Find a 95% confidence interval and state whether or not it supports your conclusion.