Econometrics: Homework 6

1. Suppose X has the following density function $f(x) = 2\lambda e^{-2\lambda x}$. We have 2 sample of X: $X_1 = 1$ and $X_2 = 0$. Estimate the value of λ using maximum likelihood estimator.

2. Y is a discrete random variable with prob(Y =1) = p and prob(Y =0) = 1- p. Suppose we have 2 observations of Y: Y_1 and Y_2 . However, we cannot observe the value of Y_1 and Y_2. We only know that $Y_1 + Y_2 = 1$. From this information, use the maximum likelihood principle to estimate p.

3. The following table show the logit estimation on how average entrance score (ASVABC) affect the probability of graduation. From this estimation result, if a student entrance score increases from 40 to 40.5. How would this change affect his probability of graduating?

GRAD	Coef.	Std. Err.	z	P>|z|
ASVABC	.1666022	.0211265	7.886	0.000
_cons	-5.003779	.8649213	-5.785	0.000

4. A doctor try to test the effect of Paracetamol pills on body temperature of patients with fever. He gets the following estimation result

body temperature = 36.7 + 0.44* Paracetamol_taken

Is his estimation biased? If yes, how to correct his estimation?

5. Using the following sample, you are asked to *manually* use least square estimator to estimate relationship $y = \beta_1 + \beta_2 X$. However, to avoid a missing variable problem, use Z as an instrument for X and estimate X in term of Z first.

y	x	z
0	1	1
1	3	2
2	6	3