Yijia Liu Assignment 1

1.

a.

$T \sim N(2.5, 0.37^2)$

P(T>=3) = 1-F(3)= 1-pnorm(3,mean=2.5,sd=0.37) = 0.08829

The probability is 8.829%.

b.

P(T<=2.5) = F(2.5) = pnorm(2.5,mean=2.5,sd=0.37) = 0.5

The probability is 50%.

c.

P(T<=2) = F(2) = pnorm(2,mean=2.5,sd=0.37) = 0.08829

The probability is 8.829%.

d.

P(T<=x) = 0.99

qnorm(0.99,mean=2.5,sd=0.37) = 3.3607

The baseball game begins at 2 p.m., so it would end at 5:22 p.m.(approximately)

e.

LB = 2.5 - 1.96*0.37 = 1.7748

UB = 2.5 + 1.96*0.37 = 3.2252

The baseball game will end between 3:46 p.m. and 5:13 p.m. (approximately)

2.

a.

	Did Not Restate Earnings (Y=0)	Restate Earnings (Y=1)	Total
No IFE on board (X=0)	0.58	0.12	0.7
IFE on board (X=1)	0.27	0.03	0.3
Total	0.85	0.15	1.00

b.

X and Y are both discrete random variables and their distributions are Bernoulli.

c.

E(Y) = 0.85*0 + 0.15*1 = 0.15

It means the possibility that a firm restates its earnings is 15%.

d.

E(X) = 0*0.7 + 1*0.3 = 0.3

It means the possibility that a firm has IFE on board is 30%.

e.

For E(Y|X=0):

P(Y=0|X=0) = P(Y=0, X=0)/P(X=0) = 0.58/0.7 = 0.828571429

P(Y=1|X=0) = P(Y=1, X=0)/P(X=0) = 0.12/0.7 = 0.171428571

E(Y|X=0) = 0*0.828571429 +1*0.171428571 = 0.17

Meaning: If the firm has no IFE on board, the possibility of restating earnings is 17%.

For E(Y|X=1):

P(Y=0|X=1) = P(Y=0, X=1)/P(X=1) = 0.27/0.3 = 0.9

P(Y=1|X=1) = P(Y=1, X=1)/P(X=1) = 0.03/0.3 = 0.1

E(Y|X=1) = 0*0.9 + 1*0.1 = 0.1

Meaning: If the firm has IFE on board, the possibility of restating earnings is 10%.

Having IFEs on board will make a firm less likely to restate earnings than having no IFEs.

f.

E(X=1|Y=1) = P(X=1,Y=1)/P(Y=1) = 0.03/0.15 = 0.2

The probability that it has an IFE on its board is 0.2.

E(X=1) = 0.3

If I did not know whether or not it had to restate its earnings, the probability will be 30%.

g.

No, they are not independent.

P(X=1,Y=1) = 0.03

P(X=1)* P(Y=1) = 0.3*0.15 = 0.045

Because P(X=1,Y=1) does not equal to P(X=1)* P(Y=1), so they are not independent.