MA 677 Momework 4 Chaogan Yin

1. MLE of P:
$$\frac{58}{70} = 0.83$$
.

2. $\times_1 - \times_n \sim \text{Bern}(\theta) = \theta^{\times} (1-\theta)^{1-\times}$

$$L(\theta, \times_1 - \times_n) = \theta^{\Xi \times} (1-\theta)^{n-\Xi \times}.$$

$$\int_{1}^{\infty} \frac{\beta e r n(\theta)}{(r + \theta)} = \frac{\theta}{2} \frac{(r + \theta)}{(r + \theta)} = \frac{1}{2} \frac{1$$

 $3 \cdot \times_1 - \times_n \sim \text{Poisson}(\Lambda) = \frac{\Lambda^* e^{-\lambda}}{\times !}$

LIA, x, -xn)= Thexp(-A) xi

$$\frac{1 - \times n}{1 - \times n} = \frac{5}{5} \times (1 - 5)^{n - 5} \times .$$

$$\frac{1 - \times n}{1 - \times n} = \frac{5}{5} \times \log(5) + (n - 5 \times 1) \log(5)$$

$$(1 - X_n)^n$$
 Bern(θ)= $\theta^{\times} (1 - \theta)^{1-x}$
 $(1\theta_1 X_1 - X_n) = \theta^{\Xi^{\times}} (1 - \theta)^{n-\Xi^{\times}}$.
 $(1\theta_1 X_1 - X_n) = \Sigma \times \log(\theta) + (n - \Sigma^{\times}) \log(\theta)$
 $(1\theta_1 X_1 - X_n) = \Sigma \times \log(\theta) + (n - \Sigma^{\times}) \log(\theta)$
 $(1\theta_1 X_1 - X_n) = \Sigma^{\times} \log(\theta) + (n - \Sigma^{\times}) \log(\theta)$

$$X_1 - X_n \sim Bern(\theta) = \theta^{\times} (1-\theta)^{1-x}$$

 $L(\theta, X_1 - X_n) = \theta^{\Xi x} (1-\theta)^{n-\Xi x}$.
 $l(\theta, X_1 - X_n) = \Xi \times log(\theta) + (n-\Xi x) log(1-\theta)$

4 $\times_{1}-\times_{n}$ \wedge $N(M,6^{2})$. $[(M,6,\times_{1}-\times_{n})] = \prod_{i=1}^{n} \frac{1}{6\sqrt{2\pi}} \exp(-\frac{1}{2}(X_{i}-M_{i}))^{2}$

 $\frac{d \cdot m \cdot 6 \cdot \times_{1} - \times_{n}}{db} = -\frac{n}{6} + \frac{\sum_{i=1}^{n} (x_{i} - n)^{i}}{6^{2}} = 0$

 $\Rightarrow \hat{G}^2 = \frac{1}{n} \sum_{i=1}^{n} (x_i - M_i)^2.$

$$1 \sim \text{Bern}(\theta) = \theta^{\times} (1-\theta)^{1-x}$$

$$1-x_n = \theta^{x} (1-\theta)^{x-x}.$$

 $\frac{d(\lambda_{1}\times_{1}\times_{n})}{d\lambda}=0 \implies \hat{\lambda}=\frac{\sum_{i}}{n}=\times_{n}. \text{ If every observe b value is 0,}$





then MLE of 2 equals 0.