LECTURE - 13 (03-28-16)]	2 -(d+1) - B
0 x, =2 N N (2 + 1) 72 + 1/2	Then to Gamma - Bd -(8+1) - Bw E T(d) Then it becomes Y - V Inv Gamma (d) 8)
Litelihood Model $X \mid \theta, =^2 \sim N(\theta, =^2)$	$:=\frac{1}{8\pi} \frac{m(q+1)}{m(q+1)} = \frac{1}{8m}$
$0 \sim N(\mu_0, \gamma^2)$ over-dispersed Normal $\chi^* X, \sigma^2 \sim N(0_p, \sigma_p^2 + \sigma^2)$	52 lo = 5~ Inv Gama (d,β)
$P(-2 X,0) \ll P(X(-2,0))P(-2 0)$	$E[w] = \frac{\beta}{\alpha - 1} \text{ if } \alpha > 1$ $\text{Mode[w]} = \frac{\beta}{\alpha + 1}$
$\int_{ z }^{\infty} \frac{1}{\sqrt{2\pi}e^{2}} e^{-\frac{1}{2}(x;-\theta)^{2}} \vartheta(\sigma^{2} \theta)$	$SE[W] = \frac{\beta}{\alpha-1} \frac{1}{\sqrt{\alpha-2}} $ for $\alpha > 2$
$S(e^{2})^{-1/2}e^{-1/2e^{2}} = (\chi_{i}-0)^{2} p(e^{2} 0)$ Let $e^{2} := \frac{1}{n} = (\chi_{i}-0)^{2}$	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$
MLE for or when 0 is known.	& Inv Gamma (d+ = , B+ = 62)
$= \left(\frac{2}{\sigma^2}\right)^{\frac{2}{N_1}} e^{-\frac{2}{N_1}} \left(\frac{2}{\sigma^2}\right)^{\frac{2}{N_1}} e^{-\frac{2}{N_1}} e^{-\frac{2}{N_1}}$	For Game (online) Inverse > (Chi-squa
Prior P(0210) & (2) e 2 2 4-1-84	Inv Gama (online) Inverse > (Chi-square online) = [52] = Moso/x
Proy $P(\sigma(\sigma)) = (\sigma) = B^{\alpha}$ $Y \sim Gamma(\alpha, \beta) := B^{\alpha}$	~6-2/x
= fy (\frac{1}{w}) [\frac{d}{dw} [\frac{1}{w}]]	$\frac{1}{\sqrt{2}} = \frac{1}{\sqrt{2}} \left(\frac{N_0 N_0}{N_0} \left(\frac{N_0 - N_0}{N_0} \right)^2 \right)$

	3					
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			:= <u>b</u>	w (",")	p Yw	
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AND THE PARTY OF STREET OF THE PARTY OF THE			E[W]=B	if 2 >1		
			[w]===	_ " ~ / !		
2						
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9)		1.50	2+1			
-	!	F.	7 0 1			
9/02/0)		SELW	$J = \frac{\beta}{\alpha - 1} \frac{1}{[\alpha - 1]}$	- for a	72	
((() .			d-1 [2-	2	/	
				1	10 L) B1	
2 0/21)		0/211	$(\sigma^2)^{-\gamma_2} e^{-n\delta}$	2 / 2	(atl) -1/2	
0)2 1(26)		1(2(D) or	(0) 0	52 (5)	e	
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, , , , ,			1 20 1=1	, ,	$= \frac{1}{N_{i-2}} \sum_{i=1}^{N_{i}} (x_{i} -$	0)
1		, beion 1	~ /		151	

 $\int_{-\infty}^{\infty} (-2, \chi, \delta) = \frac{\pi}{15} \frac{1}{150^{3}} e^{-\frac{1}{2} \cdot 2} (\chi; -\frac{1}{2})^{2}$ (3) $dn(\frac{2}{2}, x, 0) = -\frac{n}{2} dn(2\pi) - \frac{n}{2} dn(\frac{2}{2}) - \frac{n}{2}$ $\ln\left(e^{2}; \chi, \theta\right) = -\frac{n}{2e^{2}} + \frac{ne^{2}}{2(e^{2})^{2}} \Rightarrow 0 \Rightarrow \frac{\chi}{2e^{2}} = \frac{\chi^{2}}{2(e^{2})^{2}}$ $\int_{1}^{1} \left(e^{2}; \chi_{10} \right) = \frac{n^{2}}{2(e^{2})^{2}} - \frac{n^{2}}{(e^{2})^{3}}$ $\mathcal{I}(\theta) = \mathcal{E}\left[-\ln\left(e^{2}; \lambda, \theta\right)\right] = \frac{n}{\left(2\left(e^{2}\right)^{2}} - \frac{n \mathcal{E}\left[n^{2}\right]}{\left(e^{2}\right)^{3}}$ - E (X1-0)2] it frequentist = - E E (x; -0)2 El x2-20x +02 E[x2]-20E[x7+02 $\frac{1}{2(\sigma^2)^2} \frac{1}{(\sigma^2)^2} = \frac{h}{2} \frac{1}{(\sigma^2)^2}$ = 52 | Vax j(52) & JI(0) SP(=2)d=2 0 =>jlo)impaper d (2) = Inv Goma (0,0

Inv Gama (No +n , No 50 + no 2) under j(-2)= Inv Came $(\frac{n}{2}, \frac{n^{\frac{1}{2}}}{2})$ $E[-2|x,0] = \frac{n^{\frac{1}{2}}}{n-1} = \frac{1}{n-2} = (x_{i}-0)^{2} \approx \frac{1}{n-1} = (x_{i}-0)^{2}$ [0] ~ P(0, 52 | X) & P(X(0, -2) P(0, -2) Assume P(0, -2) = P(0) P(-2) jestroy's & (1) (1/2) -(-+1) -/2 = (xi-0)2 =(x;-x+x-0) $= \mathbb{Z}(x_i - \overline{x})^2 + \mathbb{Z}^2(x_i - \overline{x})$ $+ \mathbb{Z}(\overline{x} - \theta)^2 (\overline{x} - \theta)$ $s^{2} := \begin{cases} \sum_{i=1}^{2} \sum_{j=1}^{2} \sum_{j=1}^{2} \sum_{i=1}^{2} \sum_{j=1}^{2} \sum_{i=1}^{2} \sum_{j=1}^{2} \sum_{i=1}^{2} \sum_{j=1}^{2} \sum_{i=1}^{2} \sum_{j=1}^{2} \sum_{i=1}^{2} \sum_{j=1}^{2} \sum_{i=1}^{2} \sum_{j=1}^{2} \sum_{j=1}^{2} \sum_{j=1}^{2} \sum_{i=1}^{2} \sum_{j=1}^{2} \sum_{j=$ = (n-1) 32 + m (x-0)2

f(x,y) = f(x|y) f(y)f(x,y|z) = f(x|y,z) f(y|z) $P(\theta, s^{2}|X) = P(\theta|X, s^{2}) P(s^{2}|X)$ $P(\theta|X, s^{2}) \leq e^{\frac{1}{2}(\overline{X} - \theta)^{2}}$ $\leq N(\overline{X}, \frac{s^{2}}{n}) \quad \text{posterior under jetting prior}$ $= (s^{2})^{-(\frac{n}{2} + 1)} e^{-\frac{1}{2}s^{2}} ((n - 1)s^{2} + n(\overline{X} - \theta)^{2})$ $\leq N(\overline{X}, \frac{s^{2}}{n}) \left(s^{2} - \frac{(n - 1)s^{2}}{2s^{2}}\right)$ $f(x) = \int f(x,y) dy$ $f(x|z) = \int f(x,y|z) dy$ $\frac{\sup\{Y\}}{p(-2(x))} = \int p(\sigma, -2(x)) d\sigma$ $\frac{\sup\{\sigma\}}{\sup\{\sigma\}}$