	HW#3
	$I(\omega) Q(\beta) = \sum (Y_i - \beta x_i)^2$
	JQ(B) ∑Z(Yi-BX;)Xi Set o
	So. $\sum XiYi - \beta \sum Xi^2 = 0$ $\hat{\beta} = \frac{\sum XiYi}{\sum Xi}$
	B = IXIXI
	ΣXi
	(b) $E(\hat{\beta}) = E(\sum X_i Y_i) = \sum X_i E(Y_i)$ $\sum X_i^2$
·	$\sum X_i^2$
	$E(Y_i) = E(3X_i + \xi_i) = \beta X_i + 0 = \beta X_i$
	$So E(\hat{g}) = \frac{\sum x_i \beta x_i}{\sum x_i^2} = g$
	(c) $Var(\hat{\beta}) = Var(\frac{\sum x_i Y_i}{\sum x_i})$
	$= \frac{\sum x_i Var(Y_i)}{\left(\sum x_i^2\right)^2} = \frac{Var(Y_i)}{\sum x_i^2}$
	$\left(\sum X_{i}^{2}\right)^{2}$ $\sum X_{i}^{2}$
	$V_{ar}(Y_i) = V_{ar}(\beta X_i + \xi_i) = V_{ar}(\xi_i) = 6^2$
	$Var(Yi) = Var(\beta Xi + \Sigma i) = Var(\Sigma i) = \delta^{2}$ $So Var(\beta) = \frac{\delta^{2}}{\Sigma Xi^{2}}$
	$\Sigma X_i^2$
	(d) Y= XB+ &
	$Y = \begin{bmatrix} Y_1 \\ Y_2 \end{bmatrix}$ $X = \begin{bmatrix} X_1 \\ X_2 \end{bmatrix}$ , $\beta = \begin{bmatrix} \beta \end{bmatrix}$ , $\xi = \begin{bmatrix} \xi_1 \\ \xi_2 \end{bmatrix}$
	Y <sub>2</sub>
	Lynj Lynj Linj

$(e)  \beta = (X^{T}X)^{-1} \times^{T}Y$ $= \left(\begin{bmatrix} X_{1} & X_{2} & \cdots & X_{n} \end{bmatrix} \begin{bmatrix} X_{1} \\ X_{2} \end{bmatrix} \right)^{-1} \begin{bmatrix} X_{1} & \cdots & X_{n} \end{bmatrix} \begin{bmatrix} Y_{1} \\ Y_{2} \end{bmatrix}$ $= \left(\begin{bmatrix} X_{1} & X_{2} & \cdots & X_{n} \end{bmatrix} \begin{bmatrix} X_{1} \\ X_{2} \end{bmatrix} \right)^{-1} \begin{bmatrix} X_{1} & \cdots & X_{n} \end{bmatrix} \begin{bmatrix} Y_{1} \\ Y_{2} \end{bmatrix}$
=/TX1 X2 Xn7 [X] \ + [X, Xn7 [Y]
:
(Xn) (Yn)
$(\Sigma X_i^2)^{-1} \Sigma X_i Y_i$
$\frac{-\sum X_i Y_i}{(\sum X_i^2)^{-1}}$
$(f) \operatorname{Var}(\hat{\beta}) = \sigma^{2}(X^{T}X)^{-1}$
- 6 / [X   X   7   7   7
L Xn L
$= \frac{\sum x_i}{\sum x_i}$ $= \frac{\sum x_i}{\sum x_i}$
= 02
ZX;
Z. (a) Df Sum Sq. Mean Sq.
Regression 2 81117 40558.5
Error 234 23565 100.7051
Total 236 104682
(b) F= MSR = 402.7451 NF(2, 234)
P(F>402,7451) 20 = P-value.
Reject Ho.
We have sufficient evidence to condude at least one of
the B. & Bz is not O.
The second control of

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and the state of t	(C) Ho: B1=0	Ho: B2=0
and the second s	Ita, β, + 0	Ha: Bz + 0
And in the Control of	t = \$1-0 _ 8.56069	t= \beta_2 = 0.28060
Person of the Control	SE(β,) 0.31150	SE(Br) 0.0262)
	= 27,482 at (234	
	P-value = 2P(t>27.482)	P-value = 2P(t < -6.072)
and the second s	= 2P(t<-27.482)	= 5.062×10 <sup>-9</sup>
and the state of t	= 3.325×10 <sup>-75</sup>	Reject Ho
maken comment (comment (commen	Reject Ho	β, † ο.
	β, ‡0	Can't be dropped
entry of the college and colle	Can't be dropped	
A PARTITION AND AND AND AND AND AND AND AND AND AN	(d) For every one month increase in age.	the learning time
	increases by 8.56 min on average	1,7
	For every one unit incipase in GM	
or new provide learning and the second	increases by 0.28 min, on ave	,
	(e) R= SSR - 81117	
	(e) R= SCR 81117 SSTO 104682	49
	The linear regression model (learn	
	explains 77.49 % of the total	ariation in learning time.
		<i>(</i>
	3. See R-rode	
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