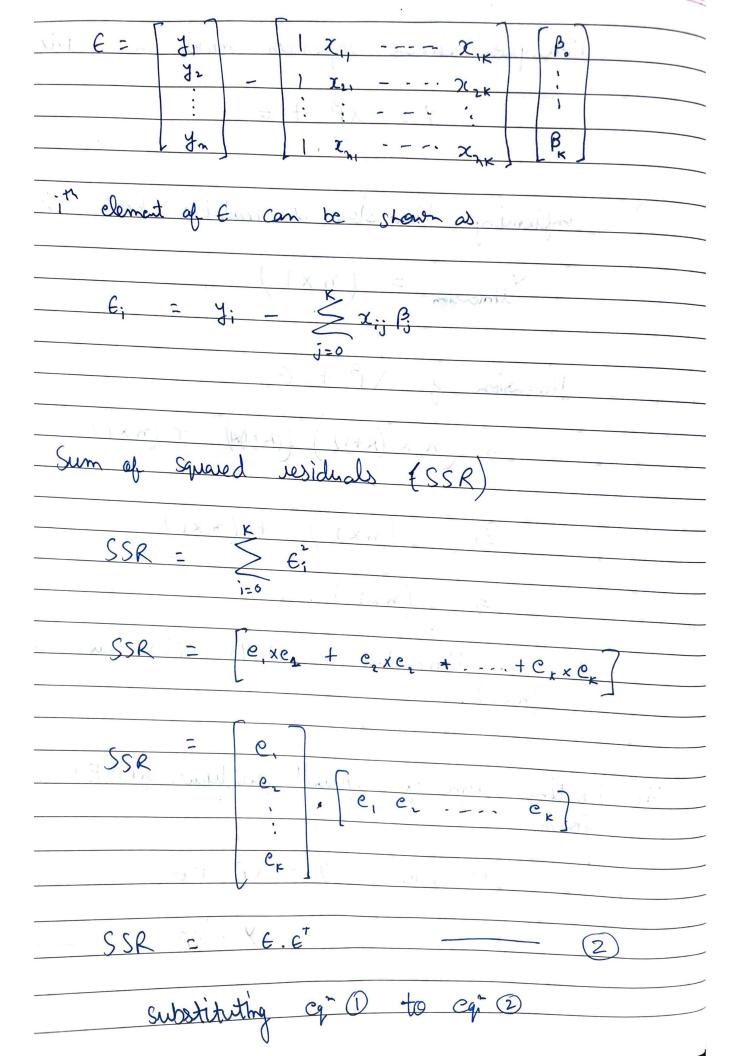
Mome work assignment-1
Problem - 1
Given: $y = y_1$ $= y_1 \times y_2 + y_1 = y_2$ $= y_1 \times y_2 + y_1 = y_1 \times y_2 + y_2 = y_1 \times y_2 = y_2 \times \times $
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$
B B B B B B B B B B B B B B B B B B B
Sum of $= \xi, \xi^T = \begin{pmatrix} \xi_1 \\ \xi_2 \\ \vdots \\ \xi_m \end{pmatrix}$ Events $\begin{cases} \xi_1 \\ \xi_2 \\ \vdots \\ \xi_m \end{cases}$
= Scaler number

Multiple linear regression model in matrix form:
$Y = X\beta + \epsilon$
(i) Conjuming dimension of matrices both sides
7 dimension = (n x1)
dimension of XB+ E
$\Rightarrow \left(\begin{array}{c} x \times (K+1) \end{array} \right) \left((K+1)x \right) + \left(\begin{array}{c} x \times 1 \end{array} \right)$
$\Rightarrow (nx1) + (nx1)$
$\Rightarrow (n \times 1)$
nerepore dimension of both sides are some i.e. : (nx1).
(i) Finding sum of squared residuals (orMSE) in matrix
We have, $Y = X\beta + \epsilon$ $\epsilon = Y - X\beta$
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SSR =
$$(Y - XB)(Y - XB)^T$$

Deriving $X^T X B^* = X^T Y$

SSR = $e^T e = (Y - XB)^T (Y - XB)$
 $\frac{\partial (SSR)}{\partial B} = \frac{\partial}{\partial B} (Y - XB)^T (Y - XB)$
 $\frac{\partial (SSR)}{\partial B} = -2 X^T (Y - XB^*)$
 $equating to zero to get B^*
 $-2 X^T (Y - XB^*) = 0$
 $X^T X B^* = X^T Y$

From eq. G in home

 $X^T X B^* = X^T Y$$

