1. Report your test on the claim that the model $y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \epsilon$ provides a good fit to x_1, x_2, x_3 and y stored in 4-19data.txt. Use SAS so the correctness of your computation for SSPE and its DF in HW08 can be confirmed.

   $H_0 : \mu(x_1, x_2, x_3) = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3$
   versus $H_a : \mu(x_1, x_2, x_3) \neq \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3$
   Test statistic: $F = \frac{MSLF}{MSPE}$
   p-value: $P(F(q-4,\, n-q) > F_{ob})$
   $F_{ob} = \frac{299.50199}{25.36667} = 11.81$
   p-value: $P(F(5,\, 5) > 11.81) = 0.0085$
   Reject H_0. Data do not support that claim of a good fit.

2. Suppose

$SSE(\emptyset)$	=	249657
$SSE(\beta_0)$	=	1857
$SSE(\beta_1)$	=	798
$SSE(\beta_2)$	=	107.8
$SSE(\beta_0,\, \beta_1)$	=	78
$SSE(\beta_0,\, \beta_2)$	=	107.7
$SSE(\beta_1,\, \beta_2)$	=	79
$SSE(\beta_0,\, \beta_1,\, \beta_2)$	=	43

   (1) For model $y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \epsilon$, fill out Type I and Type II SS.

	Type I SS	Type II SS
Intercept	249657-1897=247800	79-43=36
X1	1867-78=1779	107.7-43=64.7
X2	78-43=35	78-43=35

   (2) For model $y = \beta_1 x_1 + \beta_2 x_2 + \epsilon$,fill out Type I and Type II SS.

	Type I SS	Type II SS
X1	249657-798=248859	107.8-79=28.8
X2	798-79=719	798-79=719

3. Based on $n = 25$ observations, $\overline{y} = 22.4$ and $CSS(y) = \sum_i (y_i - \overline{y})^2 = 5785$. In model $y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \epsilon$,

	Type I SS
Intercept	12526
x1	5382
x2	168

. For model $y = \beta_0 + \beta_1 x_1 + \epsilon$, fill out ANOVA table

Source	DF	SS	MS	F
Model	1	5382	5382	307
Error	23	403	17.5217	
C.Total	24	5785		

DF of SSTO $= n - 1 = 24$; DF of SSE $= n - 2 = 23$; DF of SSM $= 1$
SSTO$= Syy = 5785$ $SSE = SST0 - SSI_1 = 403$ $SSM = SSTO - SSE = 5382$
or $SSM = SSI_1 = 5382$ $SSE = SSTO - SSM = 403$