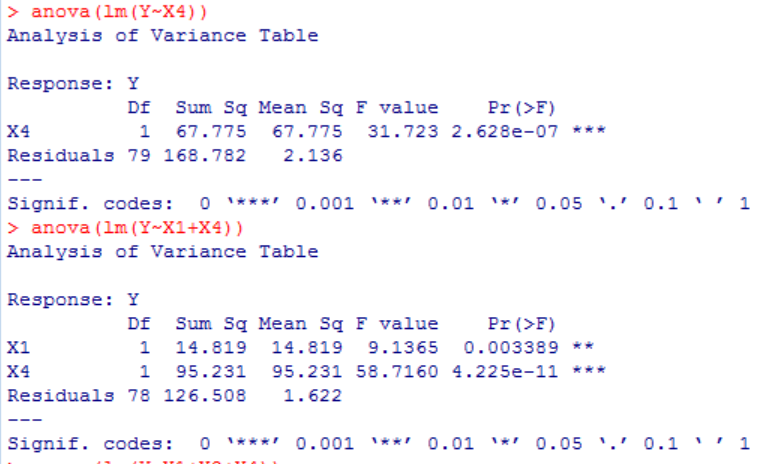
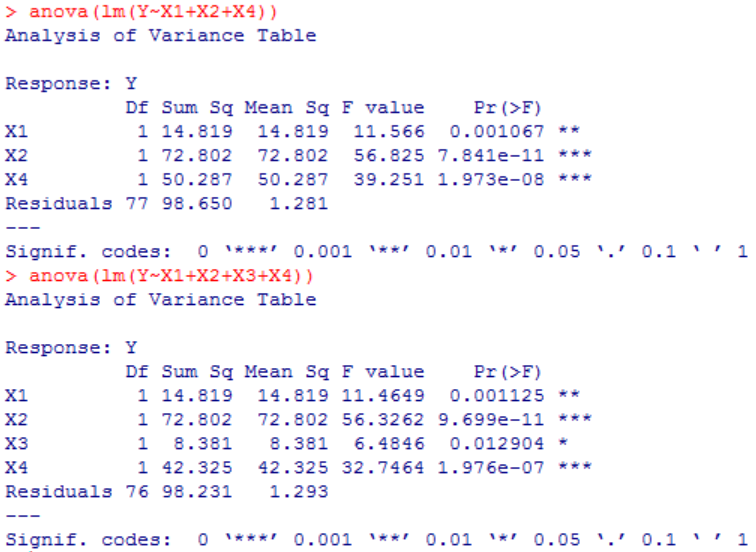
**HW7**

**Fangling Zhang**

**Q7**

**(a)**





From the above four tables, we get SSR(X4)=67.775, SSE(X4)=168.782, SSE(X1,X4)=126.508, SSE(X1,X2,X4)=98.650, SSE(X1,X2,X3,X4)=98.231. Thus SSR(X1|X4)=SSE(X4)-SSE(X1,X4)=42.274, SSR(X2|X1,X4)= SSE(X1,X4)-SSE(X1,X2,X4)=27.888, SSR(X3|X1,X2,X4)= SSE(X1,X2,X4)- SSE(X1,X2,X3,X4)=0.419.

Thus, the analysis of variance table that decomposes the regression sum of squares to extra sums of squares is as follows:

|  |  |  |  |
| --- | --- | --- | --- |
| **source** | **ss** | **df** | **ms** |
| **regression** | 138.326 | 4 | 34.582 |
| **x4** | 67.775 | 1 | 67.775 |
| **x1/x4** | 42.274 | 1 | 42.274 |
| **x2/x1,x4** | 27.888 | 1 | 27.888 |
| **x3/x1,x2,x4** | 0.419 | 1 | 0.419 |
| **error** | 98.231 | 76 | 1.293 |
| **total** | 236.557 | 80 |  |

(b)

The alternatives: : :

The full model: =++++

The reduced model: =+++

Decision rule: if

=0.419/1.293=0.324; F(0.99,1,76)=6.981

Conclusion:

p-value=0.571

**Q8**

The alternatives: :

: or

The full model: =++++

The reduced model: =++

Decision rule: if .

== =10.94

F(0.99,2,76)=4.986

Conclusion: .

p-value= 0.0000668

**Q10**

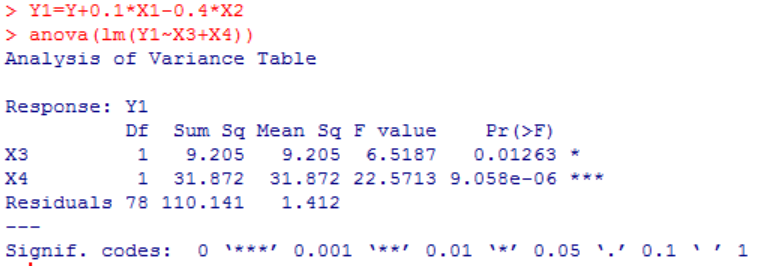
The alternatives: : : or

The full model: =++++

=+0.4+++,

so the reduced model is: =++, where -0.4

The analysis of variance table of reduced model is as follows:



Decision rule: if .

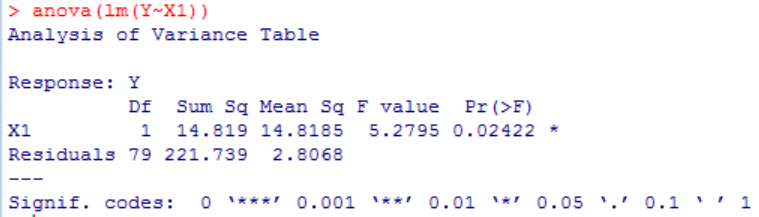
== =4.606

Conclusion: so we conclude: at 99% significant.

**Q15**

SSR(X4)/SSTO(X4) = ==0.285

SSTO=236.557



SSR(X1)/SSTO(X1) = ==0.0626

X4 can explain 28.5% of variability of Y; X1 can explain 6.26% of variability of Y.

x1 is added into regression model inclueding x4, the error sum of squares is reduced by 25.05%.

x1,x4 can explain 46.52% of variability of Y.

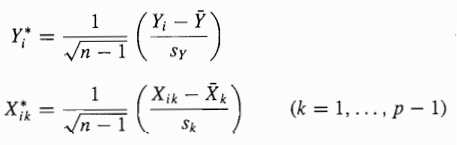
X2 is added into regression model which including X1, X4, the error sum of squares is reduced by 22.02%.

X3 is added into a regression model which including x1,x2,x4, the sse is reduced by 0.43%.

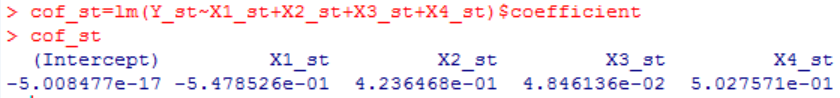
**19**

**(a)(Just obtain the standardized coefficients)**

The correlation transformation function:



The standardized coefficients are :



(b)

represents the difference in the predicted value of Y\* for each one-unit difference in (X2\*). When X2\* increases 1 unit, the Y\* will increase 0.424