Q1(21 points). Given a data set with four potential independent variables. For the following table.

ith model	R^2	Adj. R^2	C(k)	MS_{res}	SS_{Res}	I.V. in Model
1	0.9694	0.967	0.7339	1.75298	22.78876	x2
2	0.7308	0.7101	92.1947	15.41676	200.41791	x4
3	0.3486	b.	238.6936	37.30295	484.93832	x3
4	0.0085	-0.0678	369.0349	56.77528	738.07869	x1
5	0.9724	0.9678	1.5826	1.71273	20.55278	x1x2
6	0.9724	0.9678	1.5851	1.71314	e.	x2x3
7	0.9705	0.9656	2.3164	1.8315	21.97797	x2x4
8	a	0.694	91.5351	16.27105	195.25264	x3x4
9	0.731	0.6862	94.1047	16.68692	200.24308	x1x4
10	0.3669	0.2614	233.6663	39.27421	471.29049	x1x3
11	0.9736	0.9664	3.1122	d.	19.63927	x1x2x3
12	0.9731	0.9658	3.3	1.81854	20.00392	x1x2x4
13	0.9726	0.9652	c.	1.85155	20.36709	x2x3x4
14	0.7381	0.6667	93.3883	17.72432	194.96757	x1x3x4
15	0.9739	0.9635	5	1.94213	19.42134	x1x2x3x4

1. (5 points) Fill the blank a, b, c, d, e in the above table.
2. (2 points) Calculate the total variation.
3. (5 points) Fill the Analysis of variance table for the last model $y = \beta_0+\beta_1 x_1+\beta_2 x_2+\beta_3 x_3+\beta_4 x_4+\epsilon$.

Source	DF	sum of sqaure	Mean square	F-value
Model				
Error				
Total				

4. (2 points) Find the best model based on adjusted R^2.
5. (2 points) Find the best model based on $\hat{\sigma}^2$.
6. (5 points) Let $\alpha = 0.05$, implement an F-test: $H_0 : \beta 1 = \beta 3 = \beta 4 = 0$, H_a : At least one of $\beta 1, \beta 3$, and $\beta 4$ are not zero.