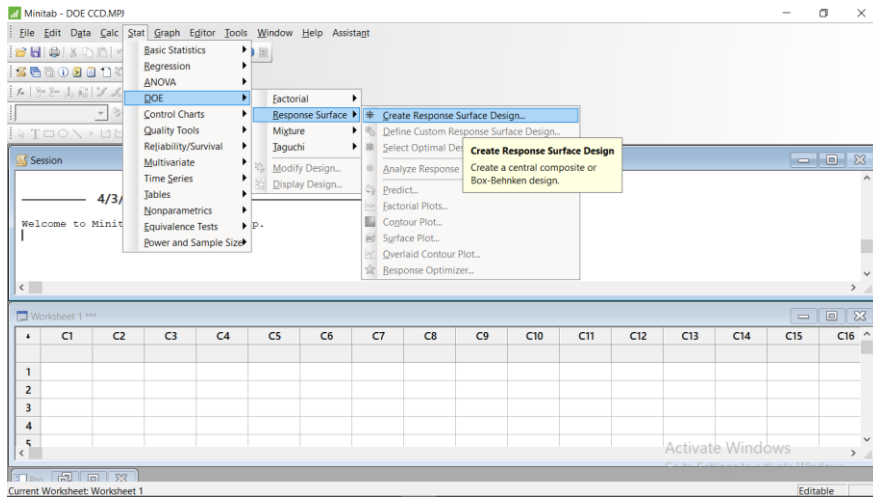
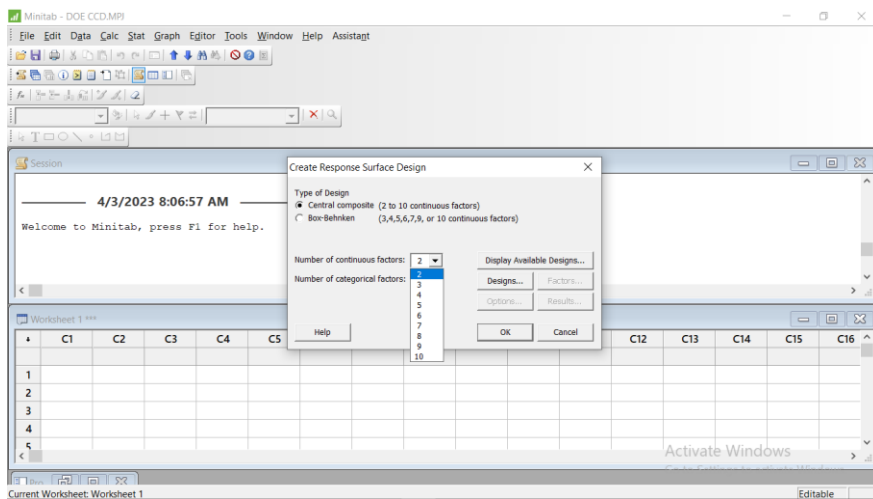


## Design and Analysis of Response Surface Design

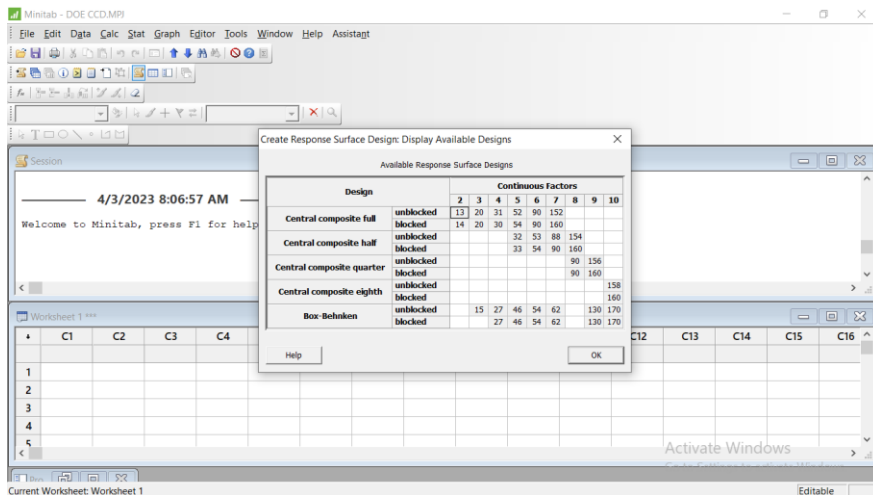
Stat > DOE > Response Surface > Create Response Surface Design



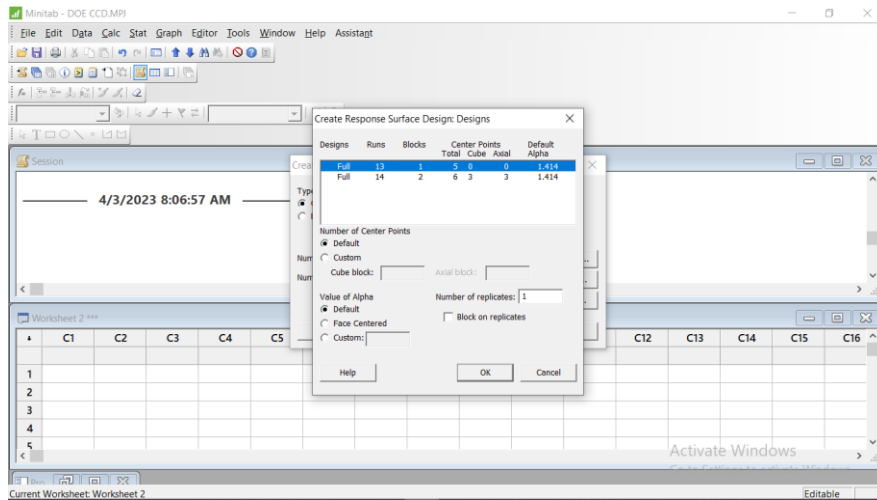
Specify number of Factors



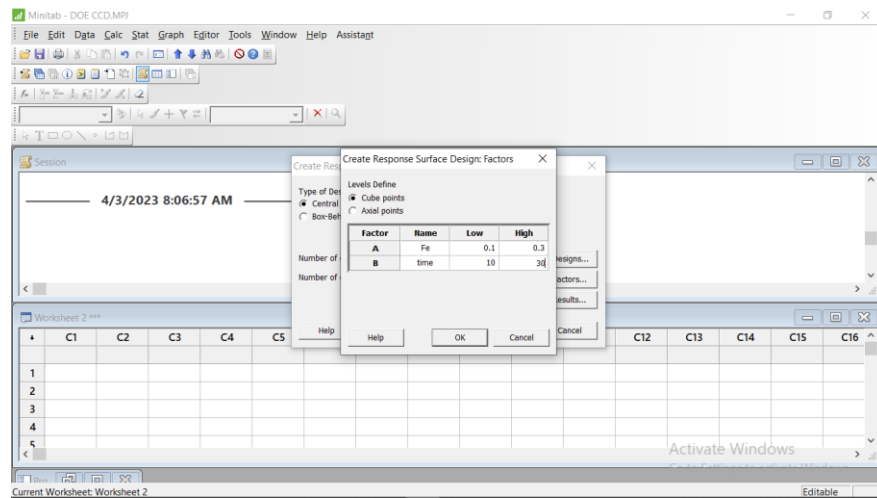
Show available designs



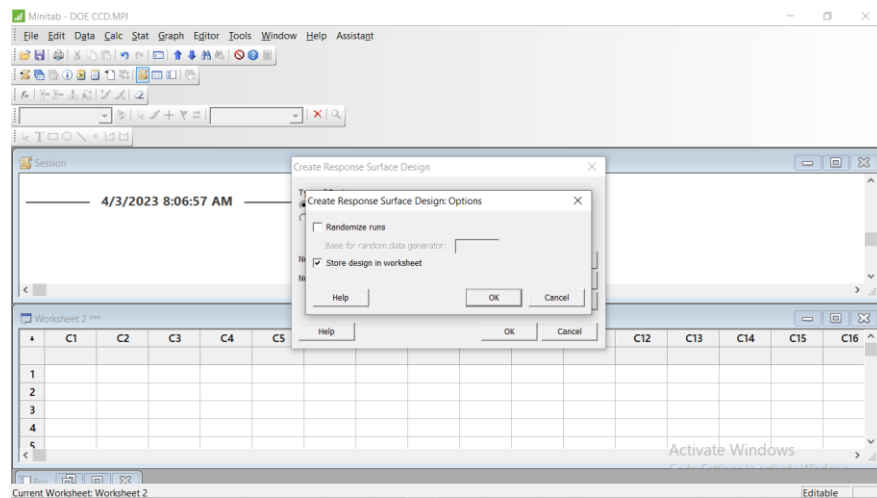
Specify total number of runs



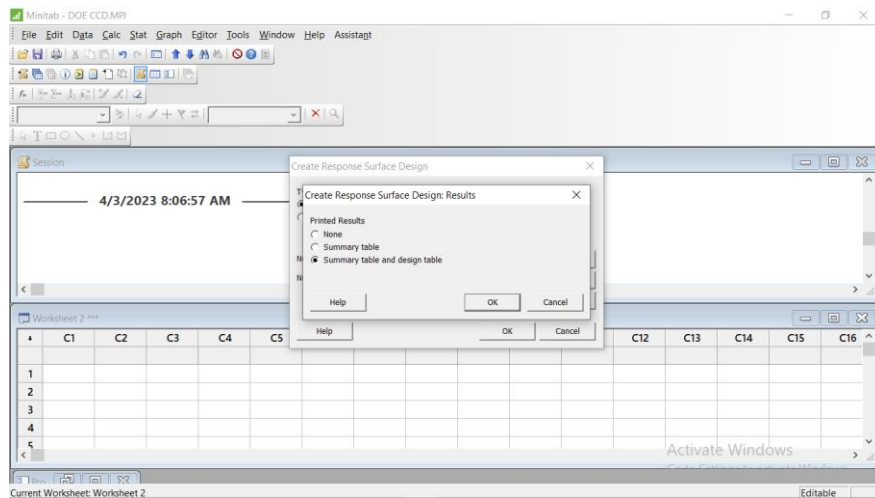
Specify factor name and limits



Specify options



Specify results



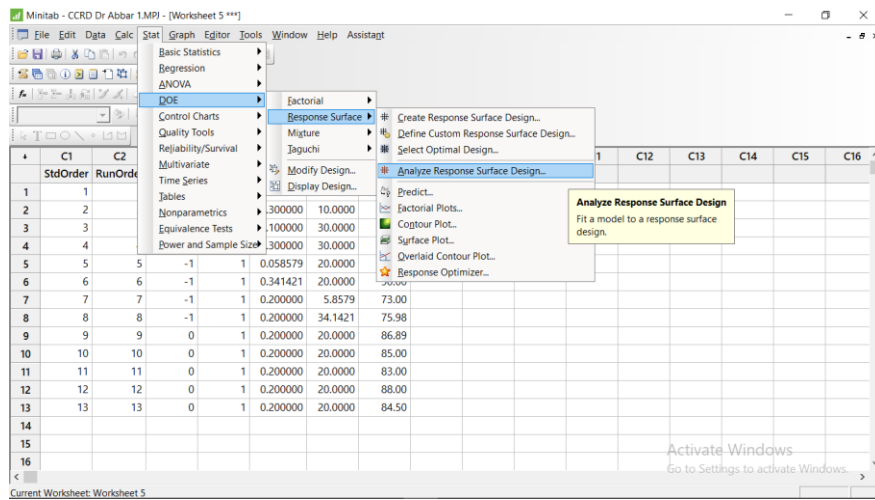
Show the design set

	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15	C16
	StdOrder	RunOrder	PType	Blocks	Fe	time										
1	1	1	1	1	0.100000	10.0000										
2	2	2	1	1	0.300000	10.0000										
3	3	3	1	1	0.100000	30.0000										
4	4	4	1	1	0.300000	30.0000										
5	5	5	-1	1	0.058579	20.0000										
6	6	6	-1	1	0.341421	20.0000										
7	7	7	-1	1	0.200000	5.8579										
8	8	8	-1	1	0.200000	34.1421										
9	9	9	0	1	0.200000	20.0000										
10	10	10	0	1	0.200000	20.0000										
11	11	11	0	1	0.200000	20.0000										
12	12	12	0	1	0.200000	20.0000										
13	13	13	0	1	0.200000	20.0000										
14																
15																
16																

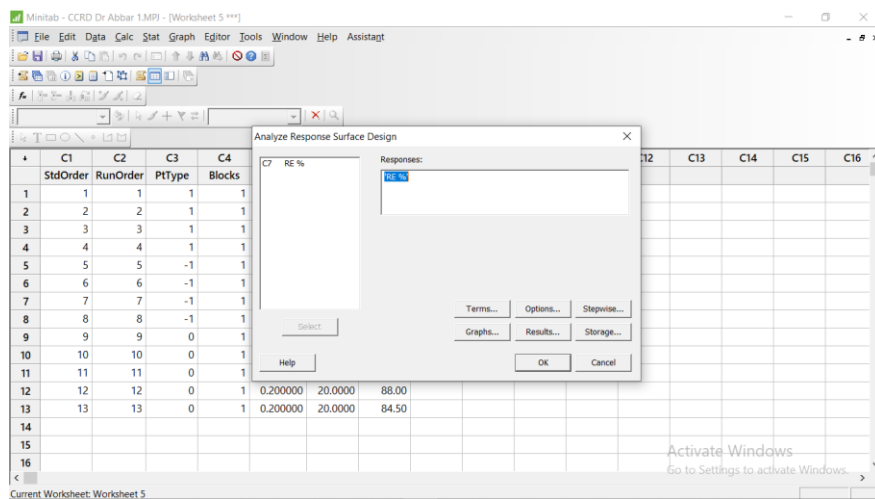
Entering the observed data (Responses)

	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15	C16
	StdOrder	RunOrder	PType	Blocks	Fe Dosage	Time	RE %									
1	1	1	1	1	0.100000	10.0000	70.00									
2	2	2	1	1	0.300000	10.0000	80.78									
3	3	3	1	1	0.100000	30.0000	68.99									
4	4	4	1	1	0.300000	30.0000	82.31									
5	5	5	-1	1	0.058579	20.0000	65.00									
6	6	6	-1	1	0.341421	20.0000	90.00									
7	7	7	-1	1	0.200000	5.8579	73.00									
8	8	8	-1	1	0.200000	34.1421	75.98									
9	9	9	0	1	0.200000	20.0000	86.89									
10	10	10	0	1	0.200000	20.0000	85.00									
11	11	11	0	1	0.200000	20.0000	83.00									
12	12	12	0	1	0.200000	20.0000	88.00									
13	13	13	0	1	0.200000	20.0000	84.50									
14																
15																
16																

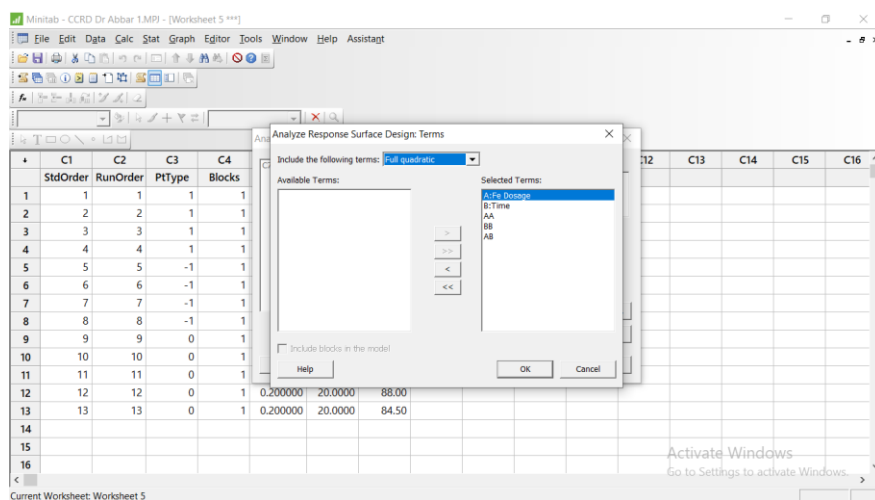
Analyze the design



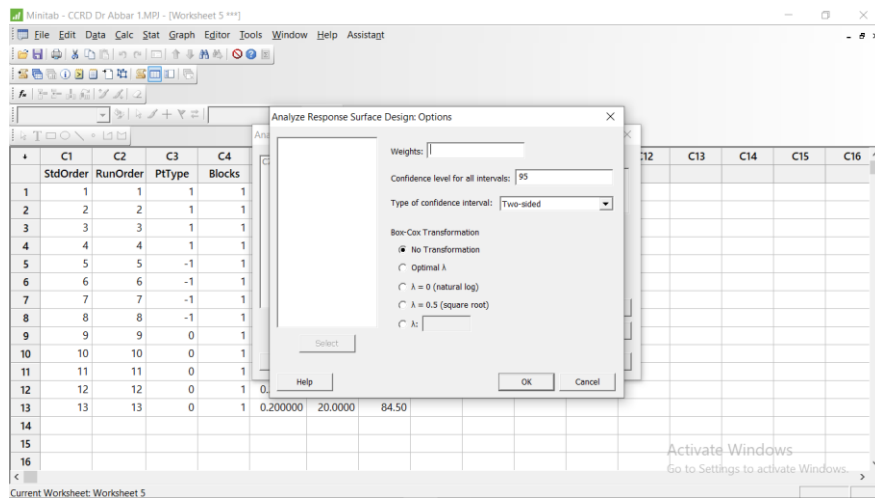
Specify Response



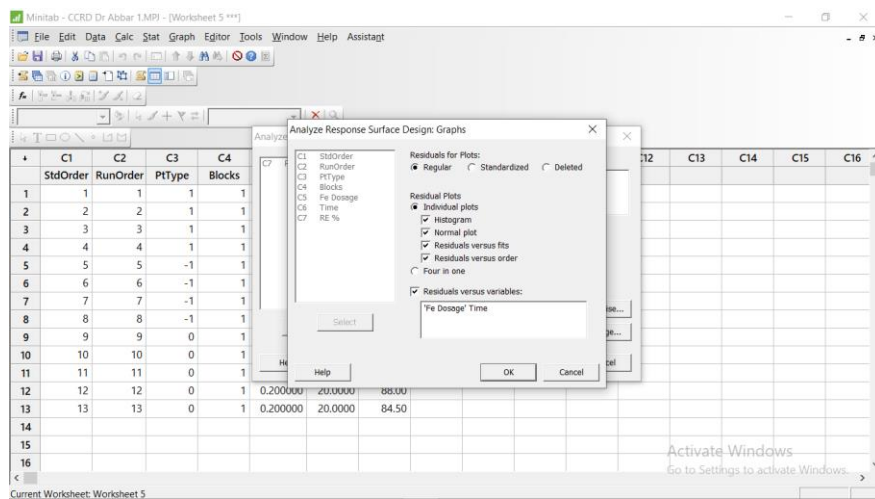
Specify Terms



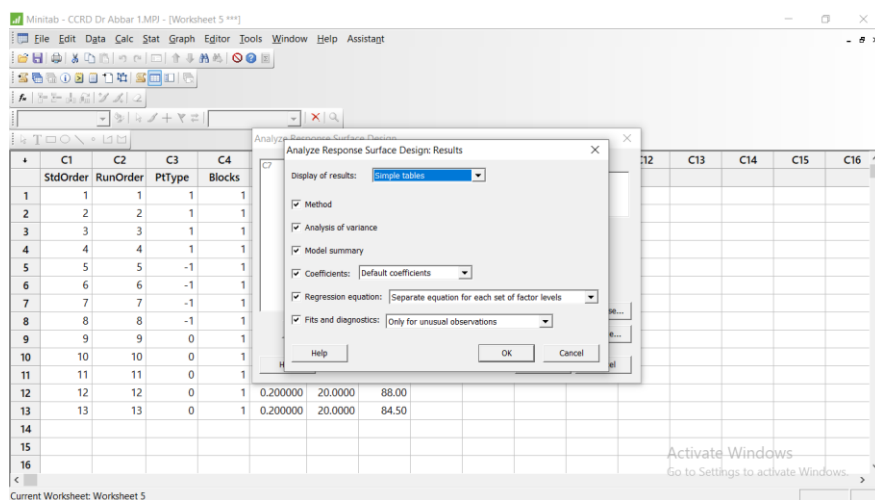
Specify options



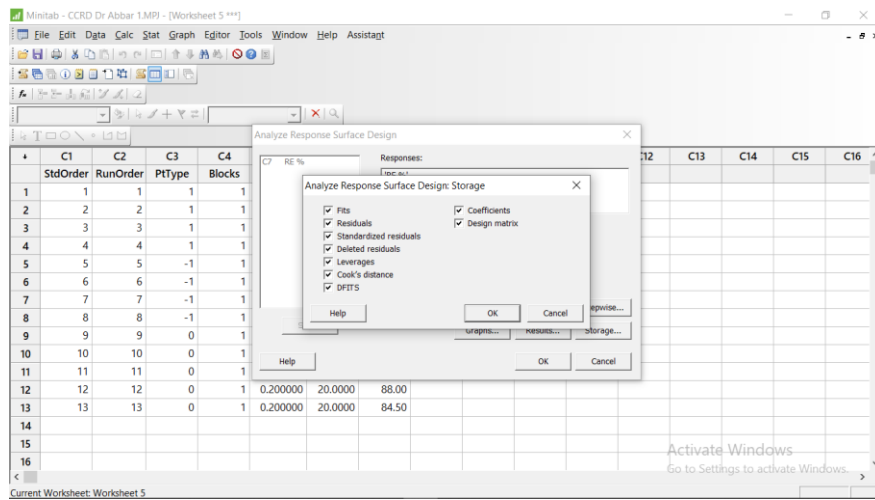
Select the required graphs



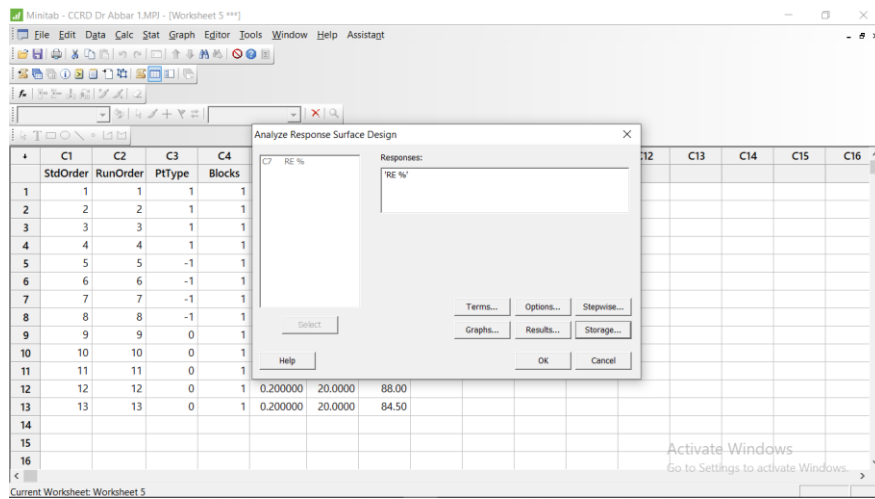
Select Results required



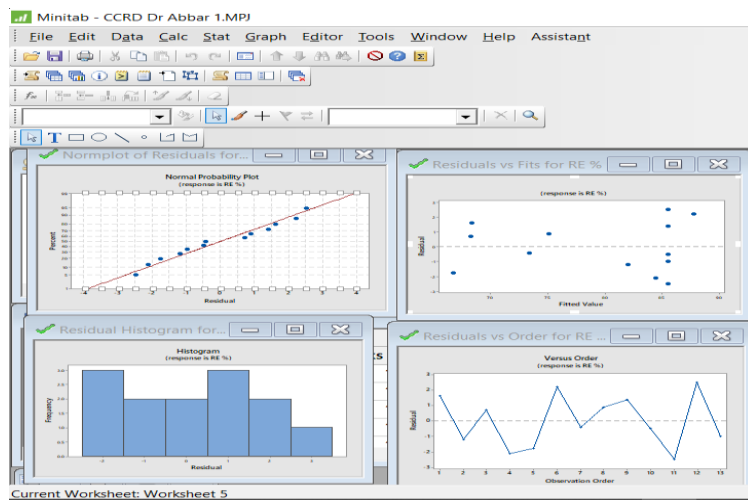
Select storage of results



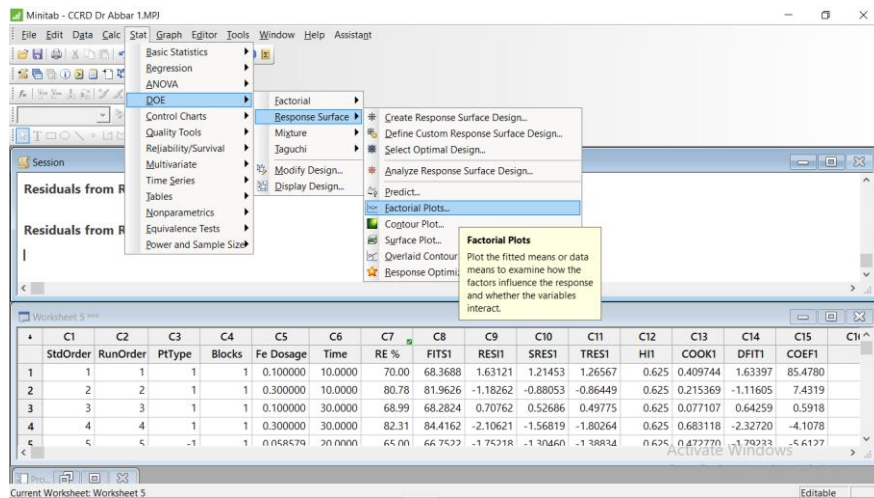
Finalize the design analysis



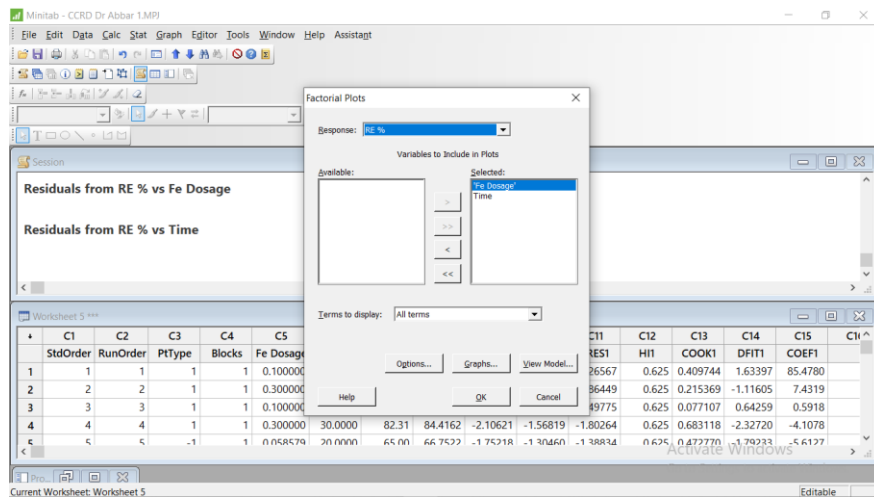
Graphs obtained



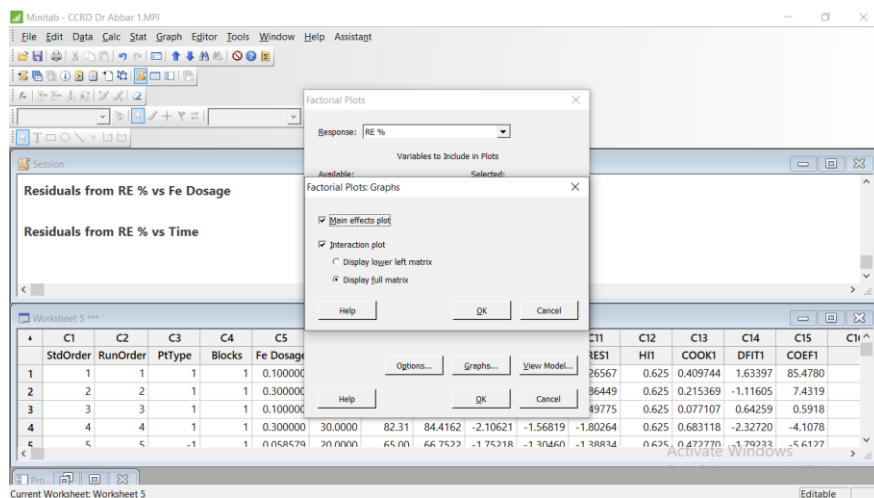
To have factorial plots



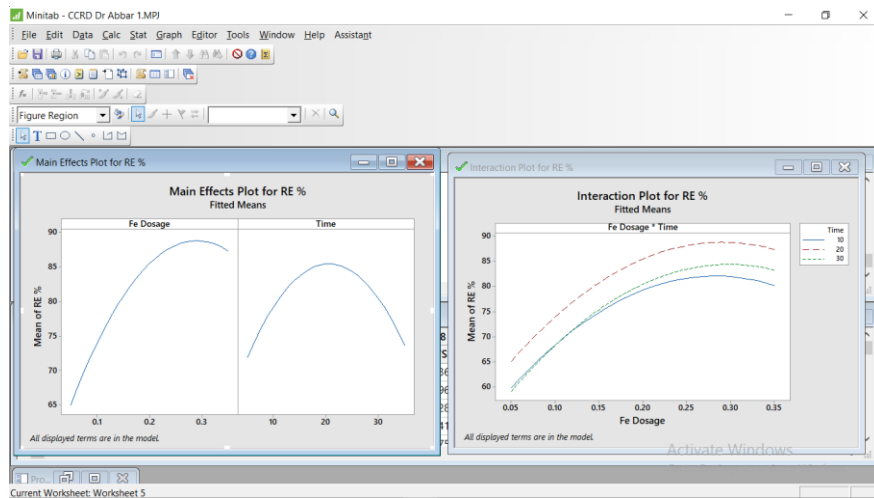
Factorial Plots requirements



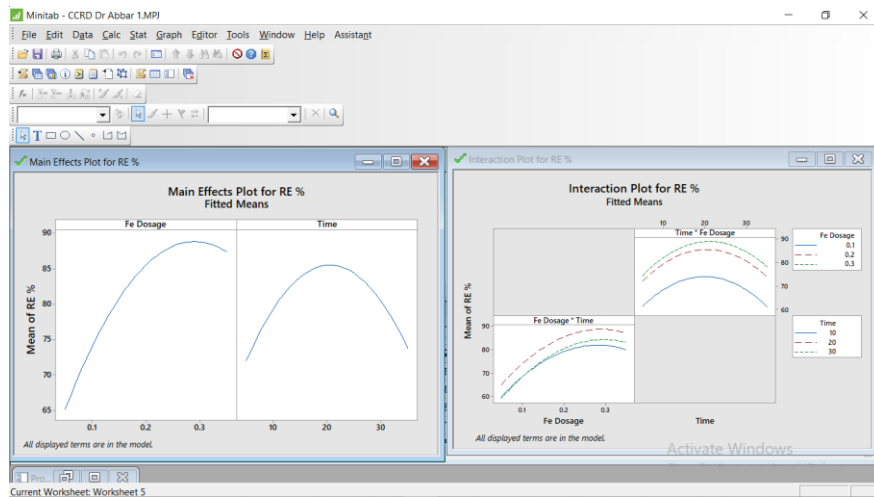
Specify graph type



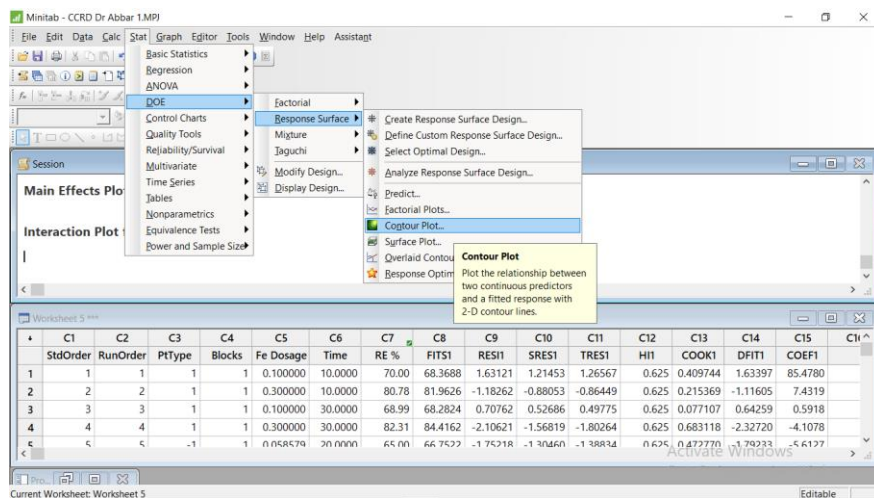
Optimization and interaction plots (required)



Full matrix plot

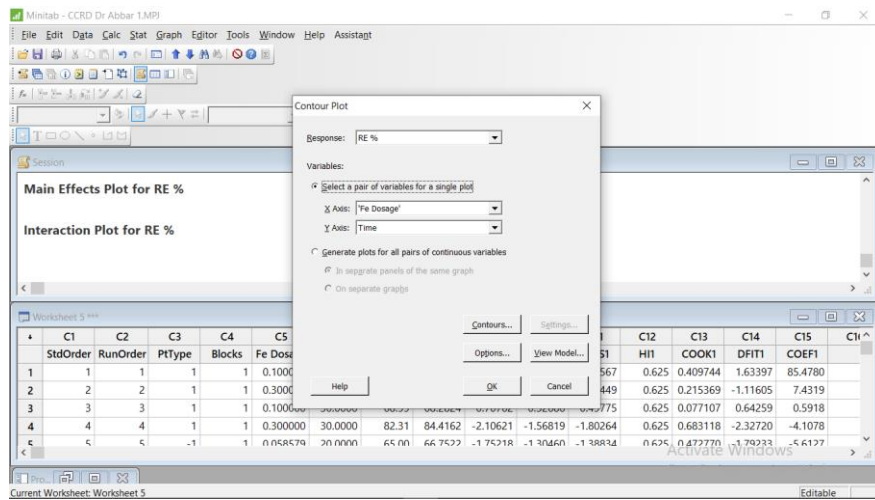


Select contour plot

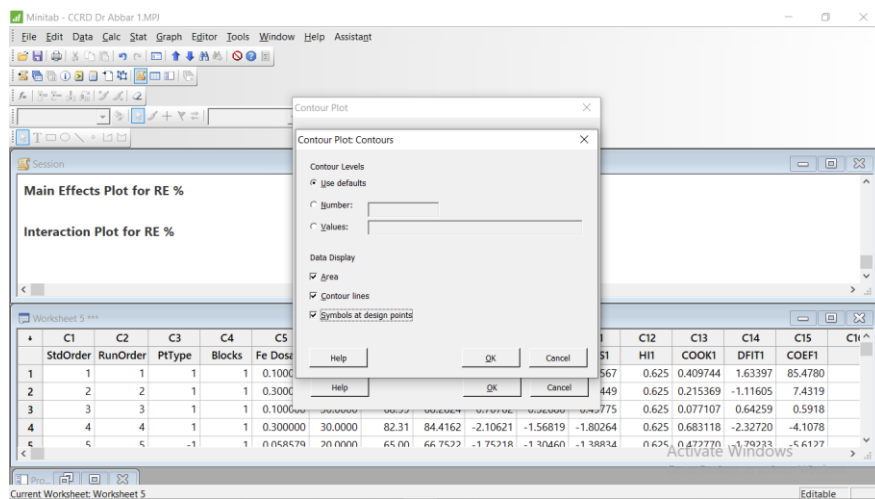




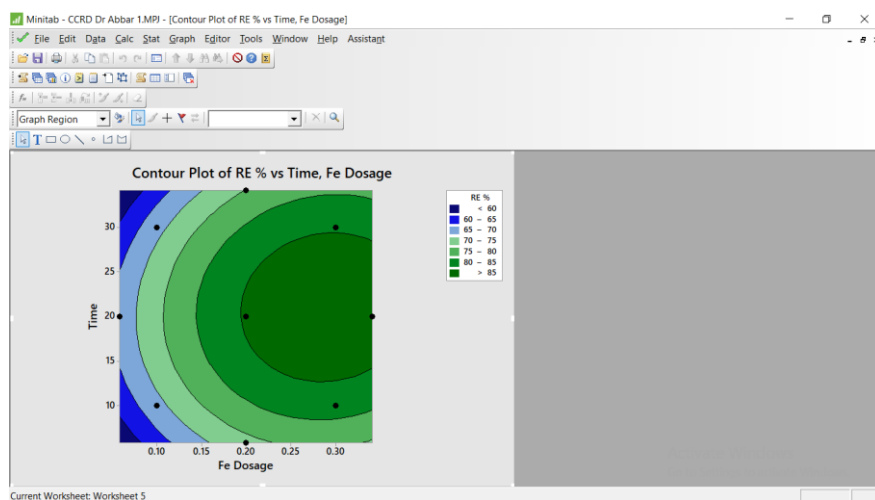
Contour plot options



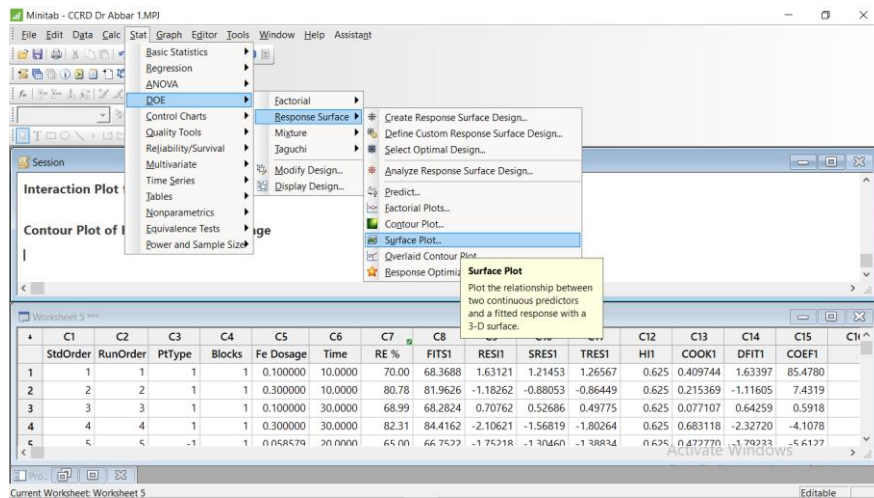
Contours required



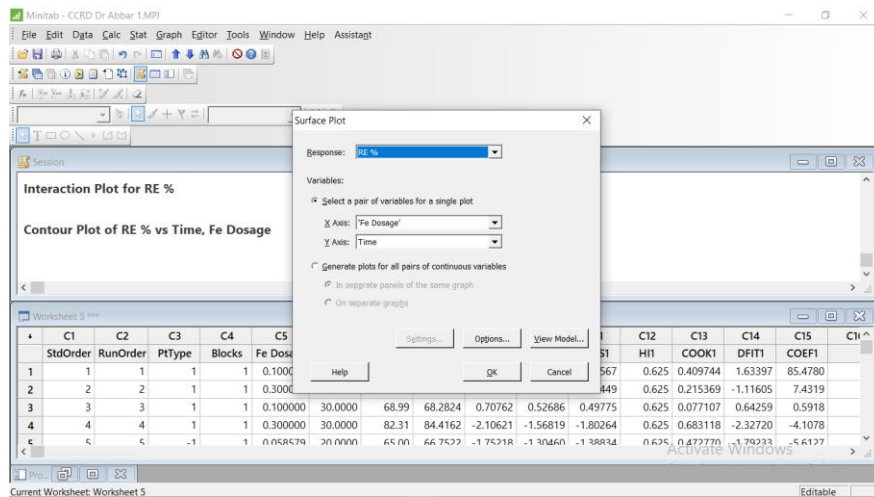
Plots



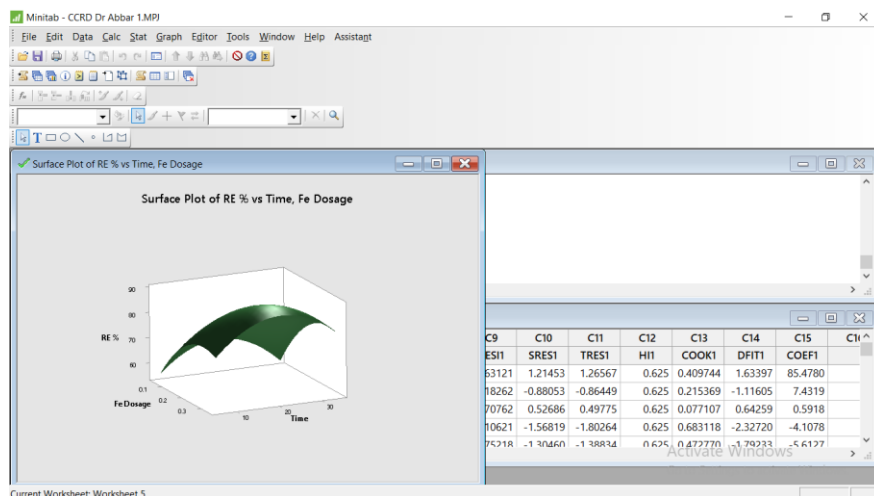
3D Plot



Plot options



3 D plot



## Response Surface Regression: %RE versus Fe, time

### Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Model	5	746.075	149.215	31.02	0.000
Linear	2	444.669	222.334	46.22	0.000
Fe	1	441.867	441.867	91.86	0.000
time	1	2.802	2.802	0.58	0.470
Square	2	299.793	149.896	31.16	0.000
Fe*Fe	1	117.382	117.382	24.40	0.002
time*time	1	219.151	219.151	45.56	0.000
2-Way Interaction	1	1.613	1.613	0.34	0.581
Fe*time	1	1.613	1.613	0.34	0.581
Error	7	33.672	4.810		
Lack-of-Fit	3	17.993	5.998	1.53	0.337
Pure Error	4	15.680	3.920		
Total	12	779.747			

### Model Summary

S	R-sq	R-sq (adj)	R-sq (pred)
2.19325	95.68%	92.60%	80.45%

### Coded Coefficients

Term	Effect	Coef	SE Coef	T-Value	P-Value	VIF
Constant		85.478	0.981	87.15	0.000	
Fe	14.864	7.432	0.775	9.58	0.000	1.00
time	1.184	0.592	0.775	0.76	0.470	1.00
Fe*Fe	-8.216	-4.108	0.832	-4.94	0.002	1.02
time*time	-11.225	-5.613	0.832	-6.75	0.000	1.02
Fe*time	1.27	0.64	1.10	0.58	0.581	1.00

### Regression Equation in Uncoded Units

%RE = 33.09 + 225.9 Fe + 2.177 time - 410.8 Fe\*Fe - 0.05613 time\*time + 0.63 Fe\*time