Predicting restaurant tips using predictive analytics on Excel.

Use excel to predict restaurant tips.

Description:

The dataset in file ***Restaurant tips dataset.xlsx*** contains tips data for different customers. The following are the features in the dataset:

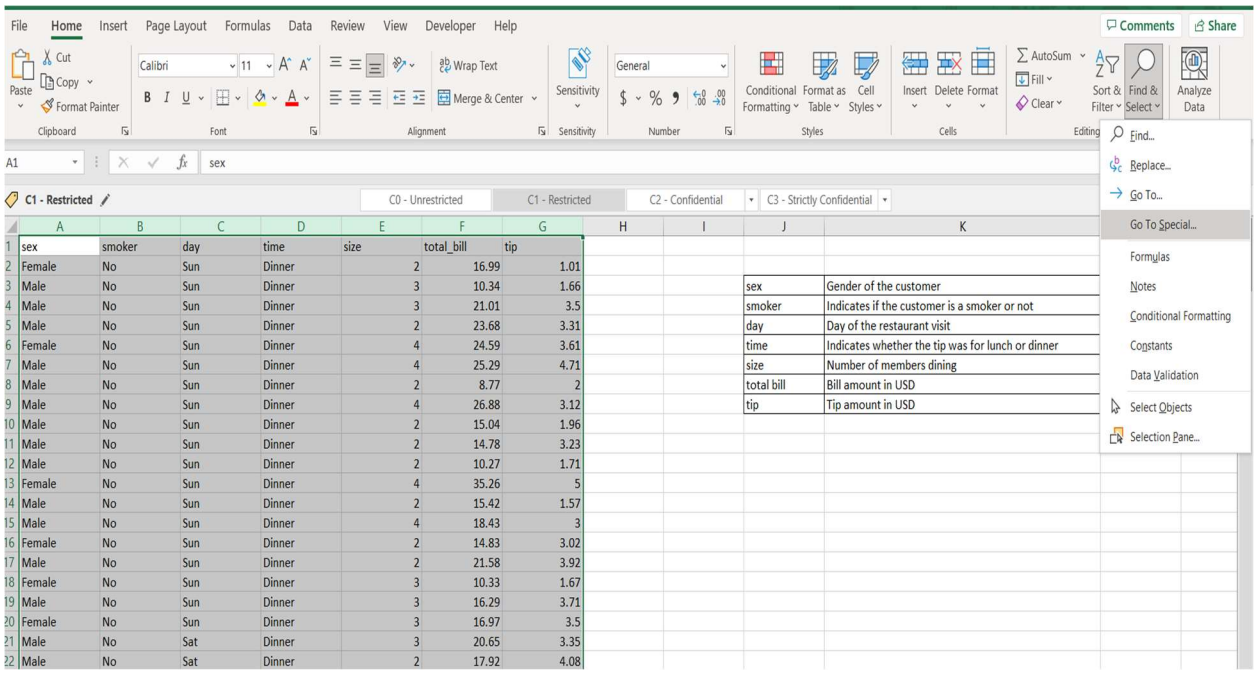
sex	Gender of the customer
smoker	Indicates if the customer is a smoker or not
day	Day of the restaurant visit
time	Indicates whether the tip was for lunch or dinner
size	Number of members dining
total bill	Bill amount in USD
tip	Tip amount in USD

The following project tasks are required to be performed in excel:

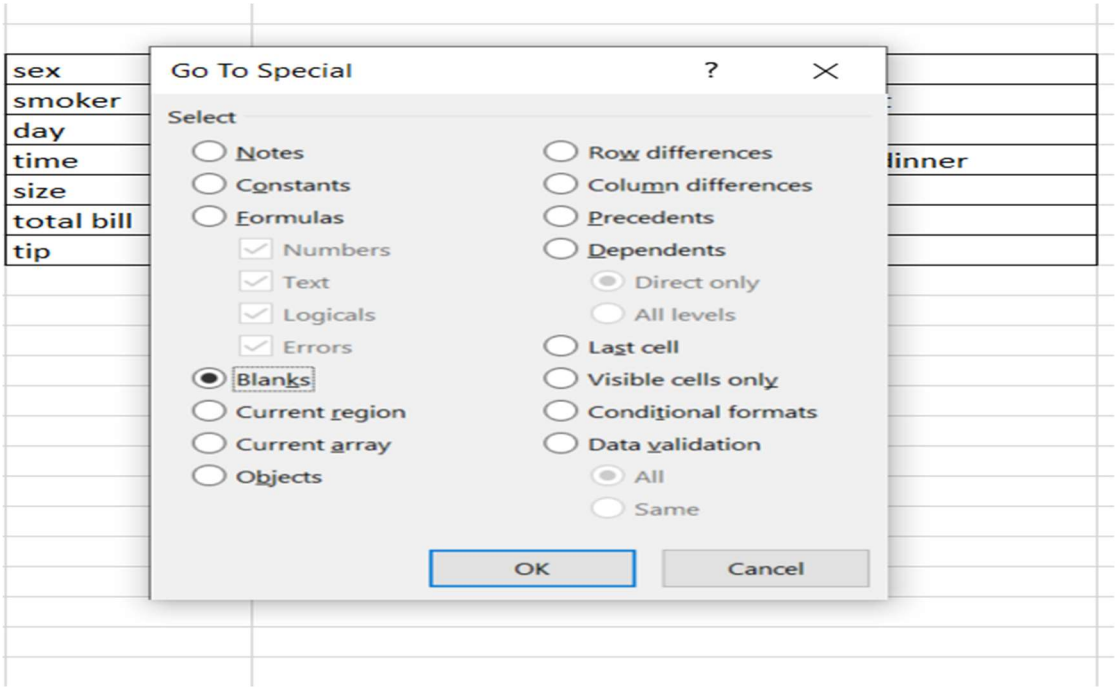
- **Use the restaurant tips file for the analytics using Excel**

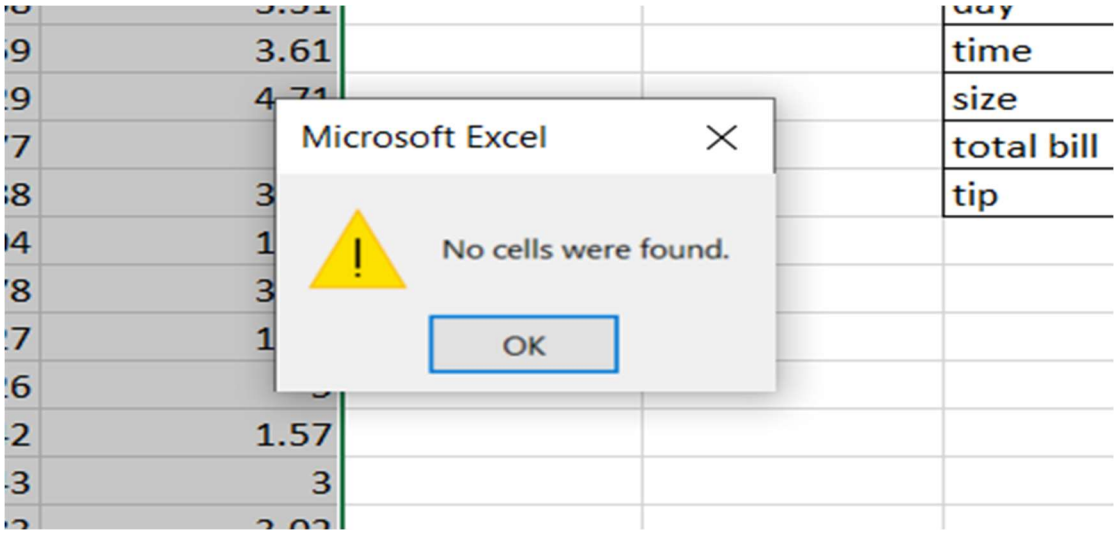
- **Find out if there are any missing values and clean the data**

➢ Process followed:



sex	smoker	day	time	size	total_bill	tip
Female	No	Sun	Dinner	2	16.99	1.01
Male	No	Sun	Dinner	3	10.34	1.66
Male	No	Sun	Dinner	3	21.01	3.5
Male	No	Sun	Dinner	2	23.68	3.31
Female	No	Sun	Dinner	4	24.59	3.61
Male	No	Sun	Dinner	4	25.29	4.71
Male	No	Sun	Dinner	2	8.77	2
Male	No	Sun	Dinner	4	26.88	3.12
Male	No	Sun	Dinner	2	15.04	1.96
Male	No	Sun	Dinner	2	14.78	3.23
Male	No	Sun	Dinner	2	10.27	1.71
Female	No	Sun	Dinner	4	35.26	5
Male	No	Sun	Dinner	2	15.42	1.57
Male	No	Sun	Dinner	4	18.43	3
Female	No	Sun	Dinner	2	14.83	3.02
Male	No	Sun	Dinner	2	21.58	3.92
Female	No	Sun	Dinner	3	10.33	1.67
Male	No	Sun	Dinner	3	16.29	3.71
Female	No	Sun	Dinner	3	16.97	3.5
Male	No	Sat	Dinner	3	20.65	3.35
Male	No	Sat	Dinner	2	17.92	4.08

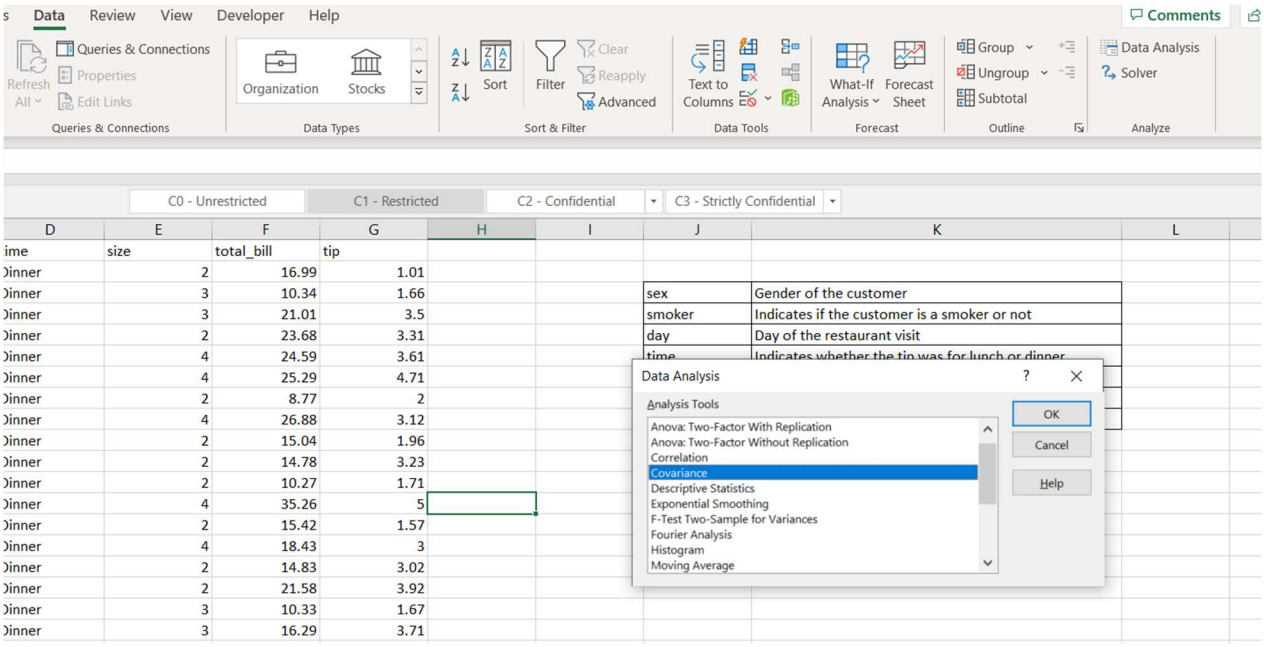




No missing value found.

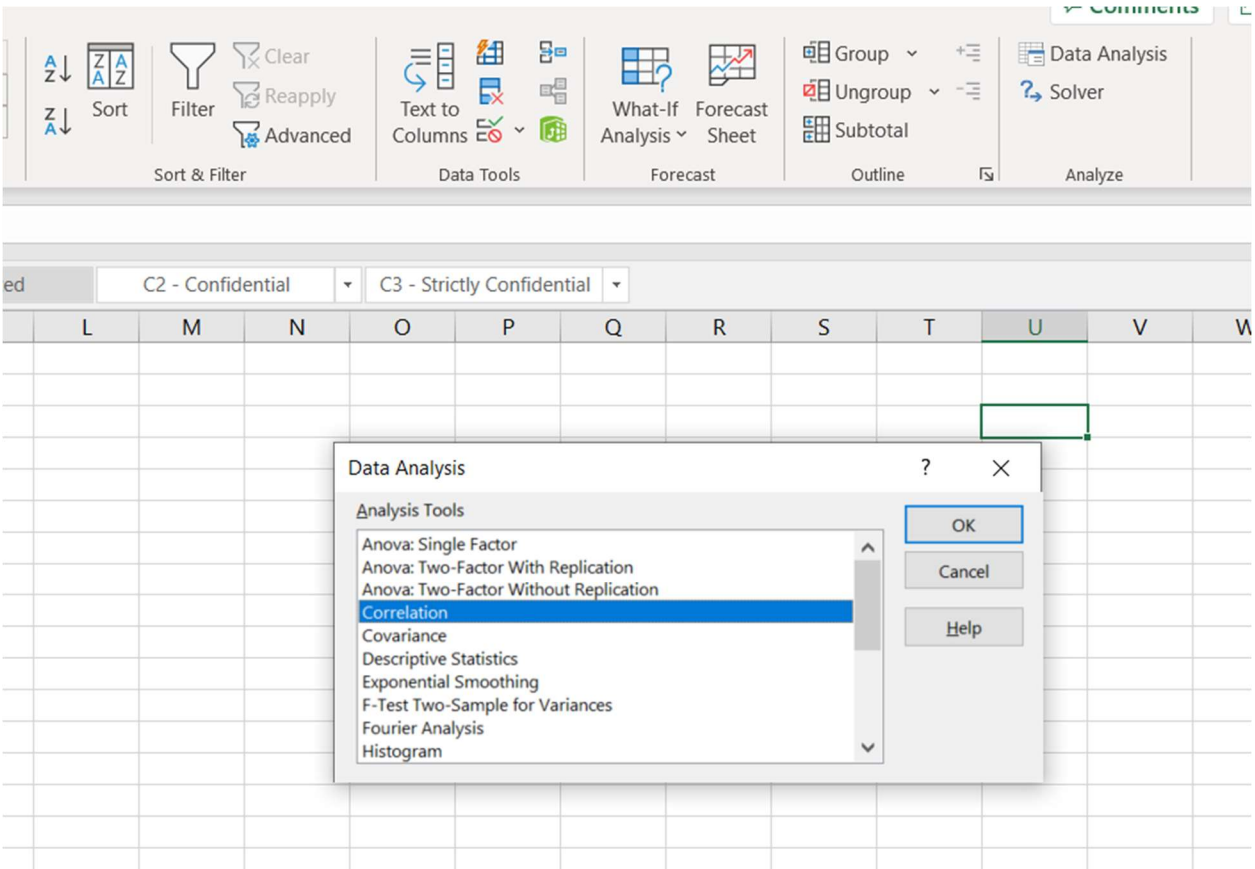
- **Find the features that are independent and dependent**

➢ Process followed:



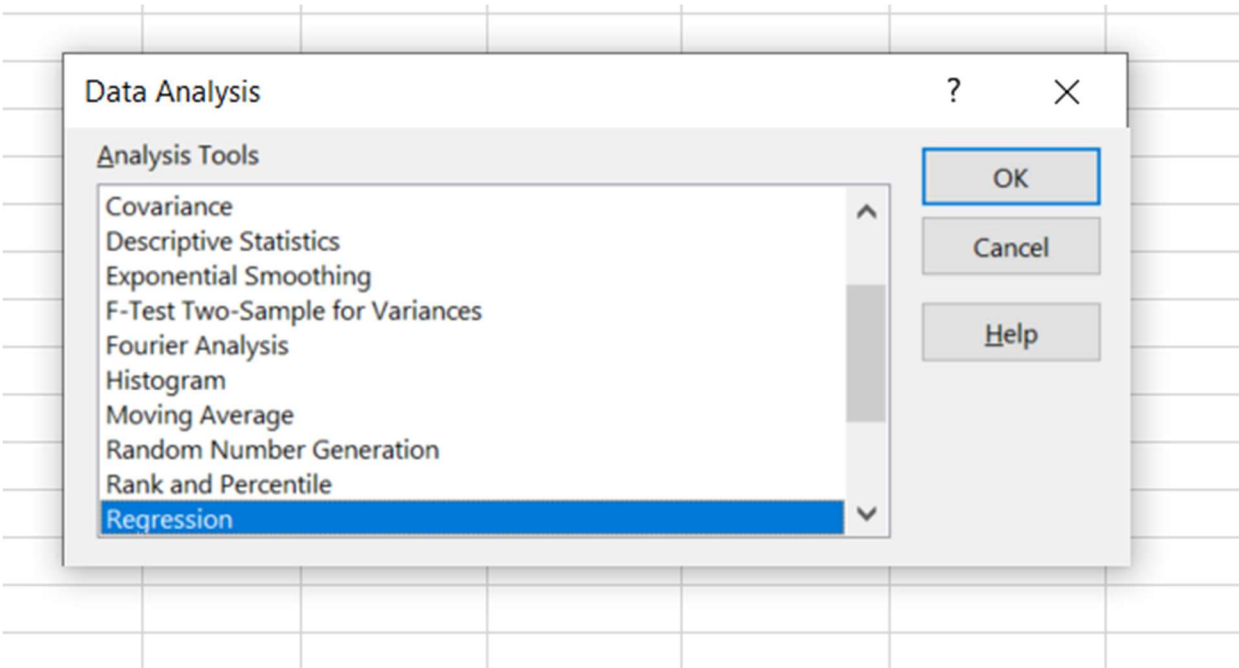
ime	size	total_bill	tip
Dinner	2	16.99	1.01
Dinner	3	10.34	1.66
Dinner	3	21.01	3.5
Dinner	2	23.68	3.31
Dinner	4	24.59	3.61
Dinner	4	25.29	4.71
Dinner	2	8.77	2
Dinner	4	26.88	3.12
Dinner	2	15.04	1.96
Dinner	2	14.78	3.23
Dinner	2	10.27	1.71
Dinner	4	35.26	5
Dinner	2	15.42	1.57
Dinner	4	18.43	3
Dinner	2	14.83	3.02
Dinner	2	21.58	3.92
Dinner	3	10.33	1.67
Dinner	3	16.29	3.71

	sex_N	*Smoker_N*	*day_N*	*time_N*	*size*	*total_bill*	*tip*
sex_N	0.229424						
Smoker_N	0.000655	0.235874					
day_N	-0.03468	-0.127	0.855466				
time_N	-0.04407	-0.01196	0.264579	0.201021			
size	0.039186	-0.06139	0.061022	-0.04401	0.900883		
total_bill	0.616504	0.369866	-0.35785	-0.7294	5.045221	78.92813	
tip	0.058771	0.003976	-0.01475	-0.0753	0.641267	8.289389	1.906609



	sex_N	*Smoker_N*	*day_N*	*time_N*	*size*	*total_bill*	*tip*
sex_N	1						
Smoker_N	0.002816	1					
day_N	-0.07829	-0.28272	1				
time_N	-0.20523	-0.05492	0.638019	1			
size	0.086195	-0.13318	0.06951	-0.10341	1		
total_bill	0.144877	0.085721	-0.04355	-0.18312	0.598315	1	
tip	0.088862	0.005929	-0.01155	-0.12163	0.489299	0.675734	1

- **Identify which predictive problem is needed.**
- ➢ Process followed:



SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.2400479
R Square	0.057623
Adjusted R Square	0.0337654
Standard Error	0.4717943
Observations	244

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	6	3.225708035	0.537618	2.415285	0.0276501
Residual	237	52.75380016	0.22259		
Total	243	55.9795082			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	1.75291	0.14677586	11.94277	4.76E-26	1.463758	2.04206192	1.46375798	2.042061921
Smoker_N	0.0005352	0.067568979	0.00792	0.993687	-0.1325773	0.13364769	-0.13257733	0.133647687
day_N	0.040233	0.045314962	0.887853	0.37552	-0.0490385	0.12950458	-0.04903855	0.129504576
time_N	-0.251524	0.091107188	-2.76075	0.006218	-0.4310073	-0.0720406	-0.43100732	-0.07204063
size	-0.0038648	0.041304752	-0.09357	0.925531	-0.0852362	0.07750655	-0.08523616	0.077506552
total_bill	0.0065336	0.005215738	1.252678	0.211557	-0.0037415	0.01680877	-0.00374149	0.016808773
tip	-0.0059049	0.030009063	-0.19677	0.844176	-0.0650235	0.05321368	-0.06502347	0.053213683

- **Encode the categorical variables to numeric values using IF conditions**
  - Process followed:

E2 =IF(F2="Fri",1,IF(F2="Sat",2,IF(F2="Sun",3,IF(F2="Thur",4))))

C1 - Restricted | C0 - Unrestricted | C1 - Restricted | C2 - Confidential | C3 - Strictly

	A	B	C	D	E	F	G	H	I	J	K
1	sex_N	sex	Smoker_N	smoker	day_N	day	time	time_N	size	total_bill	tip
2	1	Female	0	No	3	Sun	Dinner	1	2	16.99	1.01
3	2	Male	0	No	3	Sun	Dinner	1	3	10.34	1.66
4	2	Male	0	No	3	Sun	Dinner	1	3	21.01	3.5
5	2	Male	0	No	3	Sun	Dinner	1	2	23.68	3.31
6	1	Female	0	No	3	Sun	Dinner	1	4	24.59	3.61
7	2	Male	0	No	3	Sun	Dinner	1	4	25.29	4.71
8	2	Male	0	No	3	Sun	Dinner	1	2	8.77	2
9	2	Male	0	No	3	Sun	Dinner	1	4	26.88	3.12
10	2	Male	0	No	3	Sun	Dinner	1	2	15.04	1.96
11	2	Male	0	No	3	Sun	Dinner	1	2	14.78	3.23
12	2	Male	0	No	3	Sun	Dinner	1	2	10.27	1.71
13	1	Female	0	No	3	Sun	Dinner	1	4	35.26	5
14	2	Male	0	No	3	Sun	Dinner	1	2	15.42	1.57
15	2	Male	0	No	3	Sun	Dinner	1	4	18.43	3
16	1	Female	0	No	3	Sun	Dinner	1	2	14.83	3.02
17	2	Male	0	No	3	Sun	Dinner	1	2	21.58	3.92
18	1	Female	0	No	3	Sun	Dinner	1	3	10.33	1.67
19	2	Male	0	No	3	Sun	Dinner	1	3	16.29	3.71
20	1	Female	0	No	3	Sun	Dinner	1	3	16.97	3.5
21	2	Male	0	No	2	Sat	Dinner	1	3	20.65	3.35
22	2	Male	0	No	2	Sat	Dinner	1	2	17.92	4.08
23	1	Female	0	No	2	Sat	Dinner	1	2	20.29	2.75
24	1	Female	0	No	2	Sat	Dinner	1	2	15.77	2.23
25	2	Male	0	No	2	Sat	Dinner	1	4	39.42	7.58
26	2	Male	0	No	2	Sat	Dinner	1	2	19.82	3.18
27	2	le	0	No	2	Sat	Dinner	1	4	17.81	2.34

sex	Gender of the customer
smoker	Indicates if the customer is a smoker or not
day	Day of the restaurant visit
time	Indicates whether the tip was for lunch or dinner
size	Number of members dining
total bill	Bill amount in USD
tip	Tip amount in USD

Smoker	**Numeric value**
No	0
Yes	1

Day	**Numeric value**
Fri	1
Sat	2
Sun	3
Thur	4

time	**Numeric value**
Dinner	1
Lunch	2

sex	**Numeric value**
Female	1
Male	2