How to Interpret Multiple Regression Output in SPSS

Company*	Price (BDT) (x1)	Sales (in units) (y)	Brand Image (10) (x2)
A	12	2,430	7
B	15	1,870	6
C	10	3,284	9
D	18	1,012	4
E	15	1,930	6
F	12	2,136	8

The table above shows the data on which multiple regressions will be run.

The dependent variable here is Sales, and the two independent variables are Price (X1) and Brand Image (X2). We want to find out the relationship between Price and Brand Image to Sales.

So after running the regression in SPSS we get the following Output (this will be given in your exam question):

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.952[a]	.906	.844	294.49463

a. Predictors: (Constant), Brand_Image, Price

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2516774.070	2	1258387.035	14.510	.029[b]
	Residual	260181.263	3	86727.088		
	Total	2776955.333	5			

a. Dependent Variable: Sales

b. Predictors: (Constant), Brand_Image, Price

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	5435.105	5612.096		.968	.404
	Price	-244.842	229.113	-.945	-1.069	.364
	Brand_Image	3.211	376.168	.008	.009	.994

a. Dependent Variable: Sales

I will ask you people to interpret the results. So here I am giving you a sample interpretation:

Interpretation

First we look in the model summary table:

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.952[a]	**.906**	.844	294.49463

a. Predictors: (Constant), Brand_Image, Price

Here we will focus only on the R square value. For an r square of 0.906, we can say that the model explains 90.6% of the variations in real life and so the model is a good model.

Next we will look into the ANOVA table:

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2516774.070	2	1258387.035	**14.510**	**.029[b]**
	Residual	260181.263	3	86727.088		
	Total	2776955.333	5			

a. Dependent Variable: Sales

b. Predictors: (Constant), Brand_Image, Price

This table shows us the ANOVA results of the two independent variables – X1 and X2. Remember that the initial null hypothesis of ANOVA tells us that X1=X2. And the alternate hypothesis tells us that X1 is not equal to X2.

In this table we look into two values – F and the Sig (highlighted in yellow above). A high value of F means that there are more chance of the Null Hypothesis being rejected and alternate accepted, which means that X1 and X2 are different. Here it is 14.5, which means that the value is pretty high and that X1 and X2 will be different. On the other hand, the significant tells us the confidence level (1- Sig) of accepting the alternate hypothesis. Here the Sig is 0.029, which means that you are (1-0.029 = 0.971) 97.1% confident that the alternate hypothesis is accepted, and that X1 is not equal to X2.

So you can say from both the F value and the Sig value that the two variables are indeed different from each other and that they affect the Sales (Y) in a different manner.

In case if you cannot confidently reject null or accept alternate, then you must say that the variables X1 and X2 are indeed same and that multiple regression will not be possible in this case

The final step is to look into the coefficients table:

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	5435.105	5612.096		.968	.404
	Price	-244.842	229.113	-.945	-1.069	.364
	Brand_Image	3.211	376.168	.008	.009	.994

a. Dependent Variable: Sales

The important things to note in the coefficients table are highlighted in yellow. These tell us the structure of the model. The constant is the C, and then X1 is Price and X2 is Brand Image. So we can write :

Y = -244.8X1 + 3.211X2 + 5345

So price has a negative relationship with sales and that increase in 1 taka leads to a decrease in sales by 288.8 units. On the other hand, Band Image has a positive relationship with sales, and that 1 increase in Brand Image leads to 376 increase in sales.

This is how we interpret a multiple regression output in SPSS