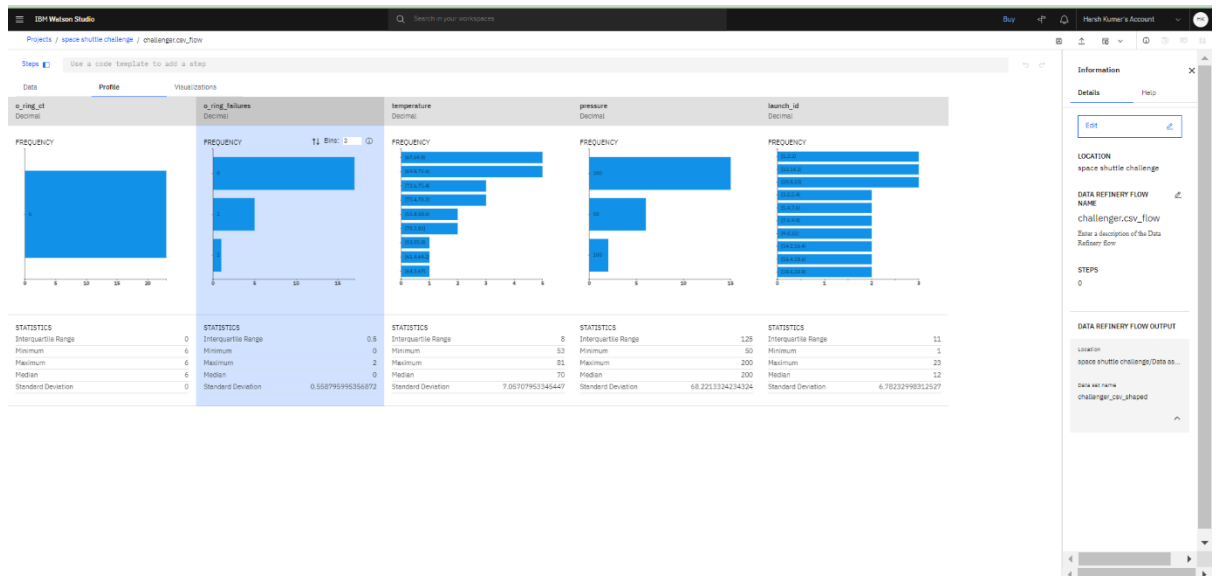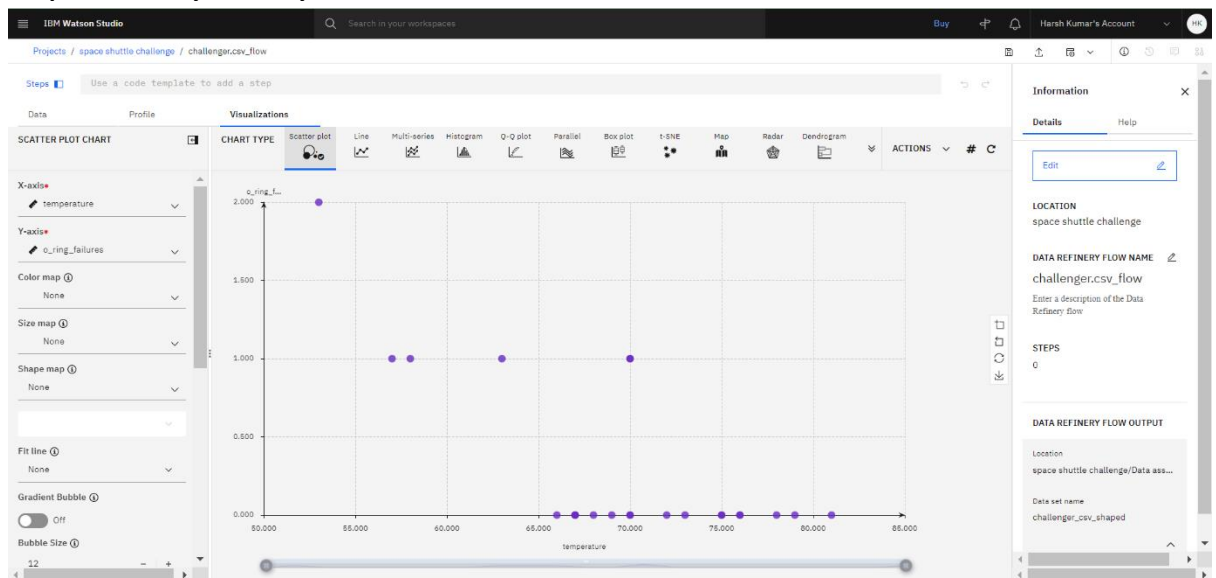# *Data Analytics*

Case Study: Risk Analysis of Space Shuttle, Multiple Linear Regression analysis.

1. Data Refinary

- Descriptive analytics of data

- Exploratory Analytics

x-axis = temperature ,y-axis – o_ring_failures

- At Lower temperature failure are more,while at higher temperature failure are very less.

x-axis=Pressure ,y-axis= o_ring_failures

2.SPSS Modeler

- **Model**

- **<u>Type node</u>**

Temperature as Input
Pressure as input
O_ring_failure as Output or terget
Other as none

- **Partition node**
    - **Training – 70%**
    - **Testing – 30%**

- **Model**

- **Output**
  - **View Model**

View Model: o_ring_failures

Regression

EVALUATION

Model Summary

Model Summary ⓘ

	1
R	0.822 [1]
R Square	0.676
Adjusted R Square	0.633
Std. Error of the Estimate	0.368

ANOVA
Coefficients

MODEL VIEWER

Build Settings
Training Summary

[1] Predictors: (Constant), [%1:, pressure, temperature

View Model: o_ring_failures

Regression

EVALUATION

Model Summary

ANOVA ⓘ

	1		
	Regression	Residual	Total
Sum of Squares	4.243	2.034	6.278
df	2.000	15.000	17.000
Mean Square	2.122	0.136	
F	15.645		
Sig.	0.000		
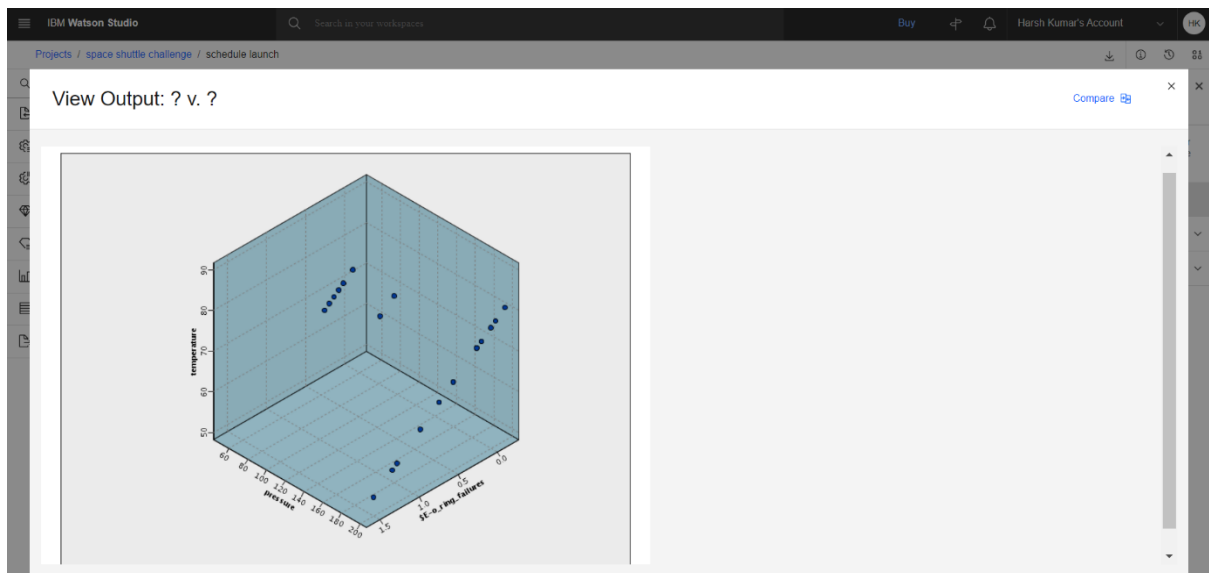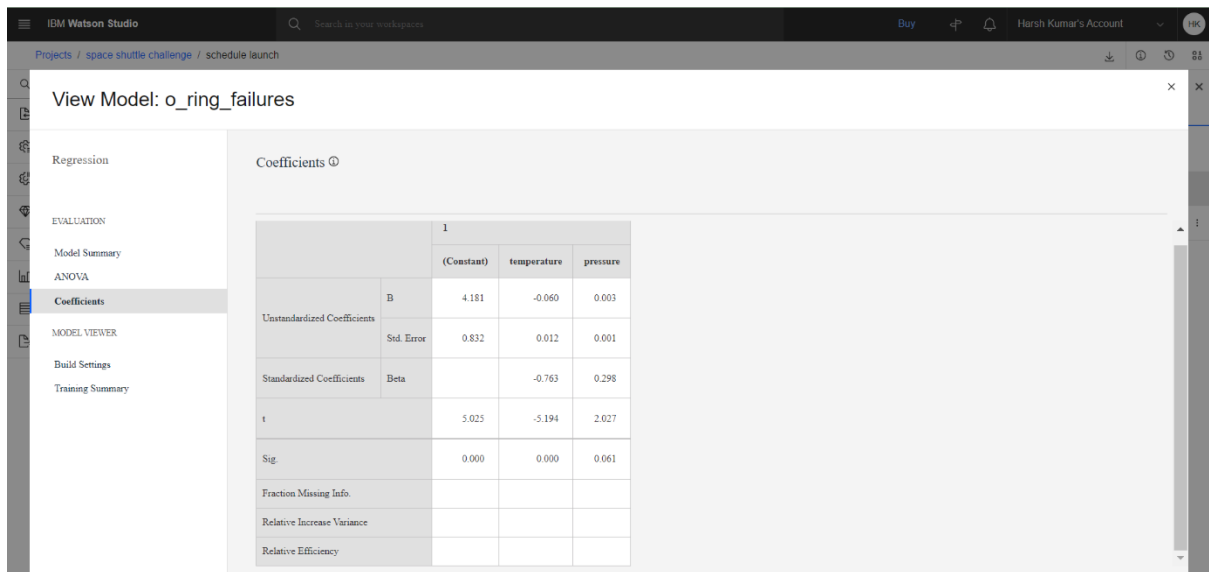
ANOVA
Coefficients

MODEL VIEWER

Build Settings
Training Summary

View Model: o_ring_failures

Regression

EVALUATION
Model Summary
ANOVA
Coefficients
MODEL VIEWER
Build Settings
Training Summary

Coefficients ⓘ

			1		
			(Constant)	temperature	pressure
Unstandardized Coefficients		B	4.181	-0.060	0.003
		Std. Error	0.832	0.012	0.001
Standardized Coefficients		Beta		-0.763	0.298
t			5.025	-5.194	2.027
Sig.			0.000	0.000	0.061
Fraction Missing Info.					
Relative Increase Variance					
Relative Efficiency					

View Output: ? v. ?   Compare

- o **Data Audit**

View Output: Data Audit of [o_ring_ct o_ring_failures temperature pressure launch_id]   Compare

	Field	Graph	Measurement	Min	Max	Mean	Std. Dev	Skewness	Unique	Valid
1	o_ring_ct		Continuous	6	6	6	0	--	--	23
2	o_ring_failures		Continuous	0	2	0.304	0.559	1.735	--	23
3	temperature		Continuous	53	81	69.565	7.057	-0.654	--	23
4	pressure		Continuous	50	200	152.174	68.221	-0.791	--	23
5	launch_id		Continuous	1	23	12	6.782	0	--	23

	Field	Measurement	Outliers	Extremes	Action	Impute Missing	Method	% Complete	Valid Records	Null Value	Empty String	White Space	Blank Value
1	o_ring_ct	Continuous	0	0	None	Never	Fixed	100.000	23	0	0	0	0
2	o_ring_failures	Continuous	1	0	None	Never	Fixed	100.000	23	0	0	0	0
3	temperature	Continuous	0	0	None	Never	Fixed	100.000	23	0	0	0	0
4	pressure	Continuous	0	0	None	Never	Fixed	100.000	23	0	0	0	0
5	launch_id	Continuous	0	0	None	Never	Fixed	100.000	23	0	0	0	0