KOREA DISCOVERY SUMMIT

EXPLORING DATA
INSPIRING INNOVATION

jmp®

김광희, 정순우 (삼성전기)

삼성전기와 함께한 JMP 20년

김광희 (Big Data 분석 전문가)
정순우 (품질 관리 기술사)

Content

1. About Presenters
2. History of using JMP in SEMCO
3. Introduce Case

DISCOVERY SUMMIT

jmp

About Presenters

- Introduction

김광희 프로

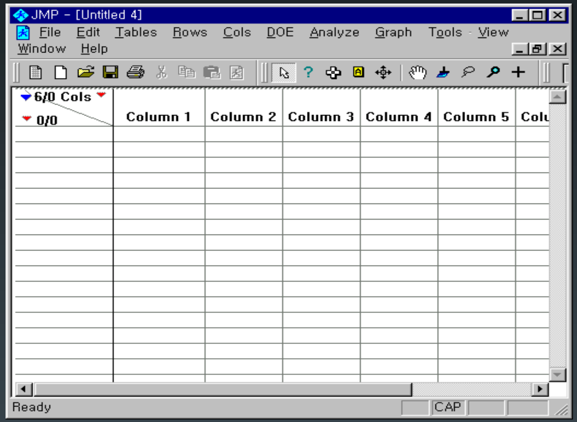
. Major : Physics
. Career : 20 years
. Experience :
 - Package Tech / Dev. / Quality
 - AI training course Completion
. In house JMP trainer
. JMP discovery summit presenter
 (3 times)

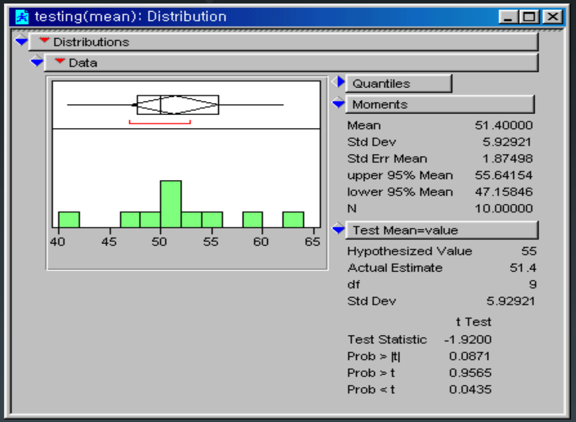
정순우 프로

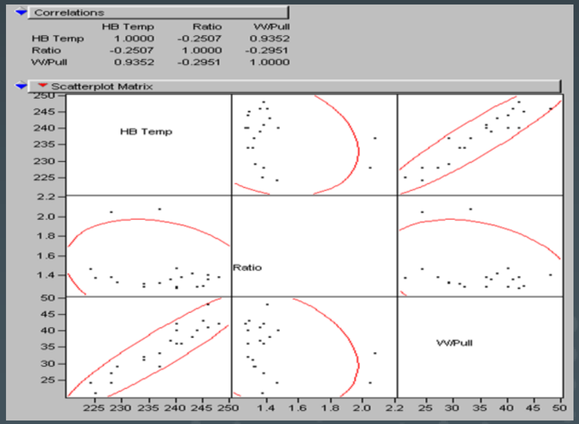
. Major : Electronics
. Career : 21 years career
. Experience :
 - PKG Assembly / Lead frame Dev. & CS / FCB Quality
. Certification
 - Professional Engineer for Quality Mgmt.
 - Certified Mgmt. Consultant
. DOE, MSA, APQP in house trainer
. JMP discovery summit presenter (3 times)

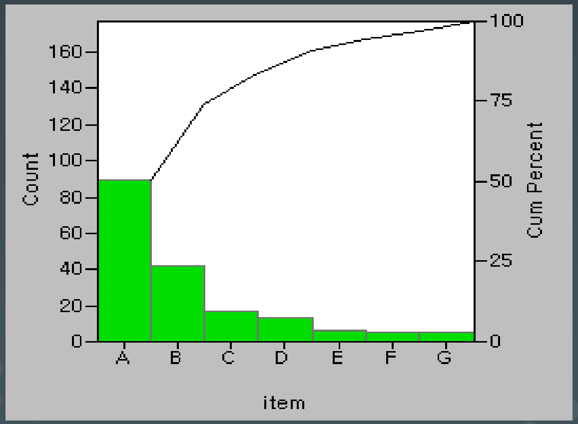
Changing JMP appearance

JMP 4

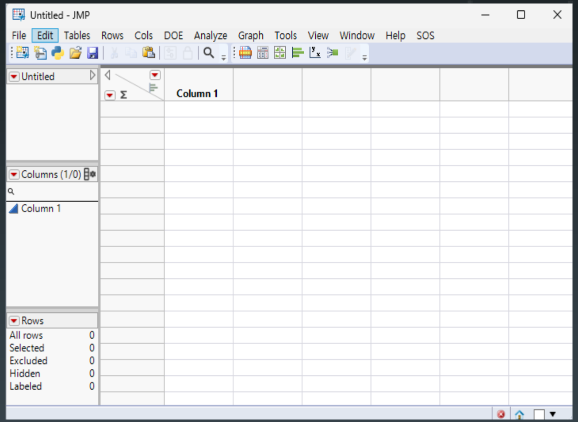


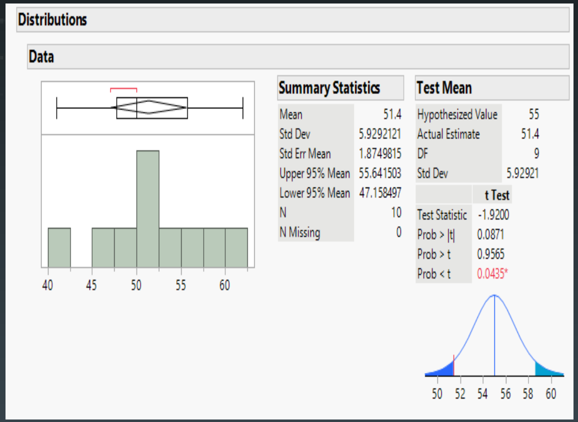


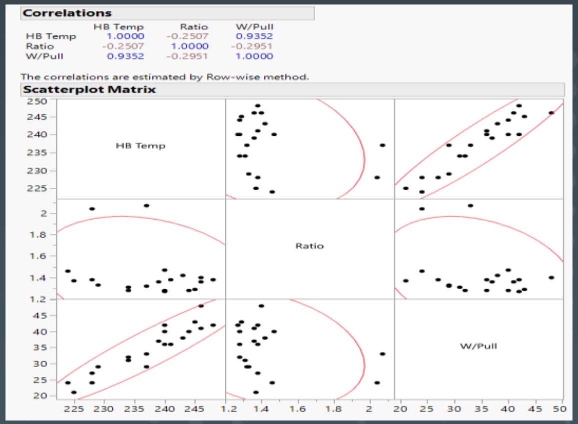


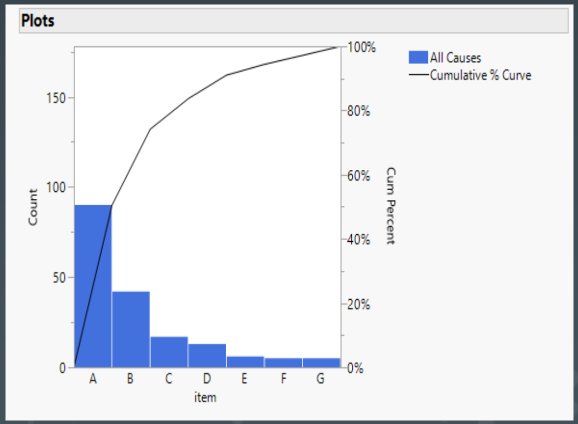


JMP 18









DISCOVERY SUMMIT

jmp

History of using JMP in SEMCO

Trend for SEMCO statistics

2006 | 2015 | 2020 | 2025

SEMCO Statistics

Beginner

. 2006 ~ 2014

. 6sigma (using minitab)
. JMP use only customer responder
. Trend monitoring

Step-up

. 2015 ~ 2020

. Management interest statistics
. Training for JMP
. Join JMP Korea team

Mature

. 2021~2025

. Join JMP discovery summit
. JMP instructor SEMCO
  - JMP basic, Hypothesis test and DOE
. Big data analysis

2015. Dec, JMP training in Seoul

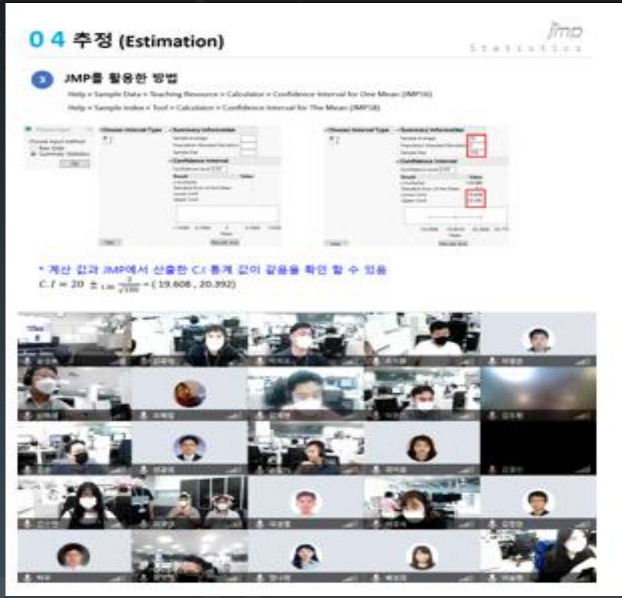
DISCOVERY SUMMIT

jmp

2024. Nov , JMP discovery summit

2025. July , SEMCO

2025. Oct , SEMCO



Case Examples

Category	Purpose	JMP Function used
Excursion	Problem definition	Distribution, Graph builder
	RC analysis	Regression, Pareto
	Risk assessment	Partition, Logistic
Optimization & Improvement	DOE	Fit model
Monitoring	CCB (Change board)	Fit y by X (2sample T), 2 Proportion
	SPC	Control chart builder
	MSA	MSA, Variability/Attribute Gauge Chart
Others	Automation	JMP Script

Case Examples

Category	Purpose	JMP Function used
Excursion	**Problem definition**	**Distribution Graph builder**
	RC analysis	Regression Pareto
	Risk assessment	Partition Logistic
Optimization & Improvement	DOE	Fit model
Monitoring	CCB (Change board)	Fit y by X (2sample T) 2 Proportion
	SPC	Control chart builder
	MSA	MSA Variability/Attribute Gauge Chart
Others	Automation	JMP script

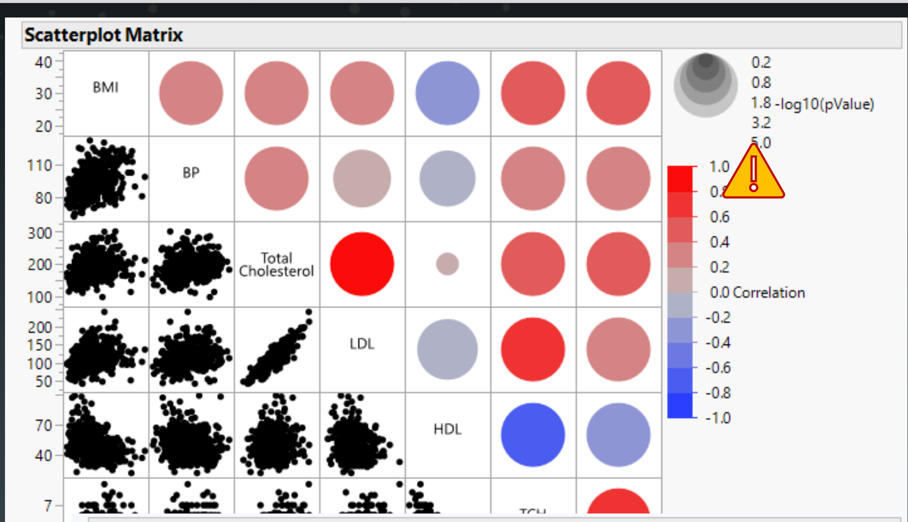
- Multiple Chart Types in One Place : Scatter plots, Line charts, Box plots, Histograms
- Customizable for Reports : Edit titles, fonts, labels
- Integrated with JMP's Data Table : Selections in the graph highlight rows in the data and vice versa.
- Very Fast with Large Data, Filter in real-time, Outlier detection

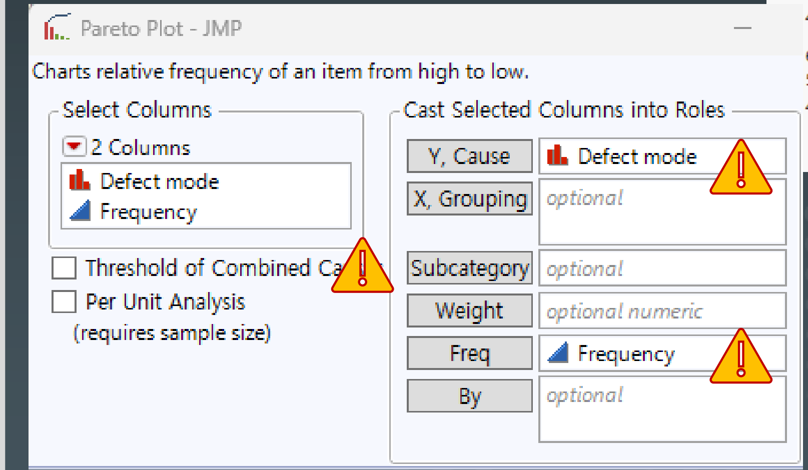
Case Examples

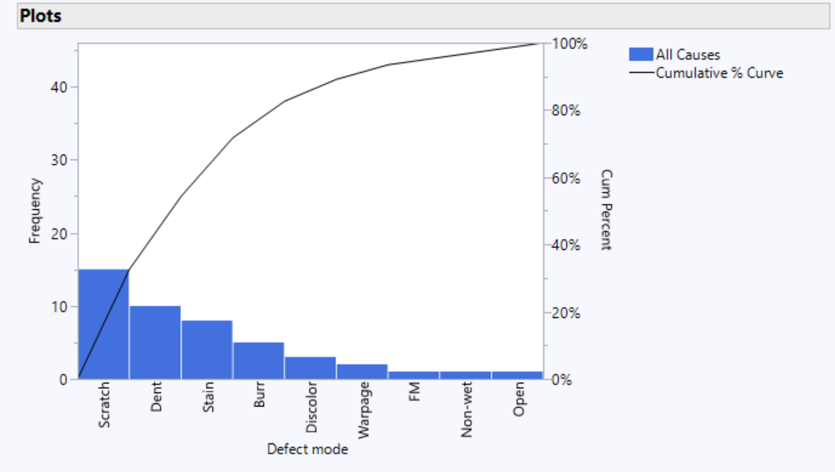
Category	Purpose	JMP Function used
Excursion	Problem definition	Distribution Graph builder
	RC analysis	**Regression Pareto**
	Risk assessment	Partition Logistic
Optimization & Improvement	DOE	Fit model
Monitoring	CCB (Change board)	Fit y by X (2sample T) 2 Proportion
	SPC	Control chart builder
	MSA	MSA Variability/Attribute Gauge Chart
Others	Automation	JMP script

- Multivariate, Fit Y by X : Easily identifies relationships using scatterplot matrices, Significance circles.

- Pareto : Shows the major contributors in descending order for effective prioritization. Easily set or adjust the threshold





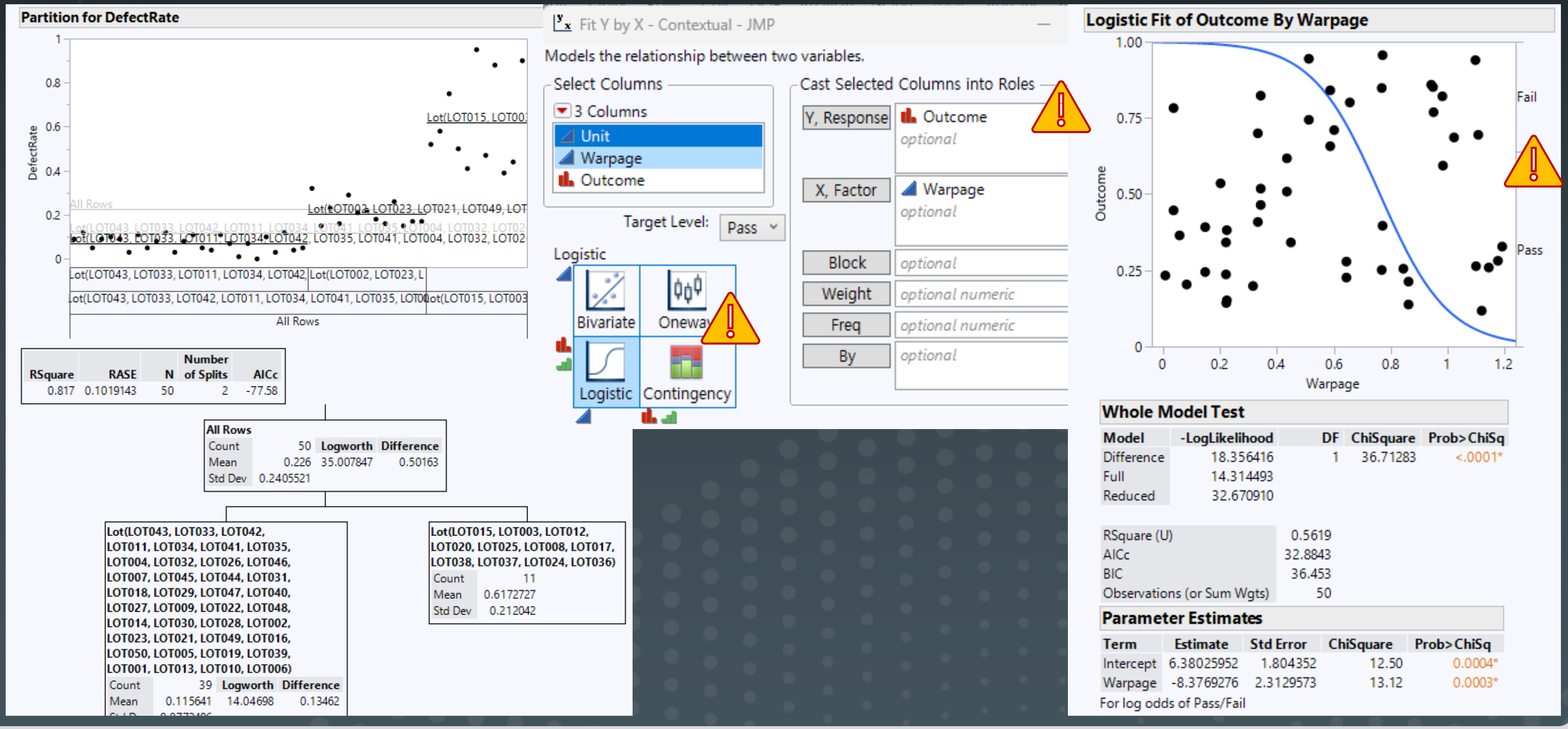


DISCOVERY SUMMIT

Case Examples

Category	Purpose	JMP Function used
Excursion	Problem definition	Distribution Graph builder
	RC analysis	Regression Pareto
	Risk assessment	**Partition Logistic**
Optimization & Improvement	DOE	Fit model
Monitoring	CCB (Change board)	Fit y by X (2sample T) 2 Proportion
	SPC	Control chart builder
	MSA	MSA Variability/Attribute Gauge Chart
Others	Automation	JMP script

- Partition :
  - Prediction and Classification
  - Risk levels are defined using the split feature.
- Logistics regression : Predict binary or categorical outcomes



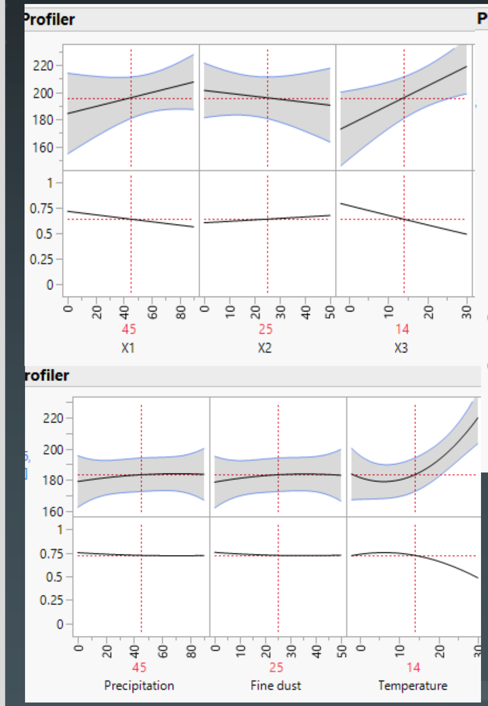
DISCOVERY SUMMIT

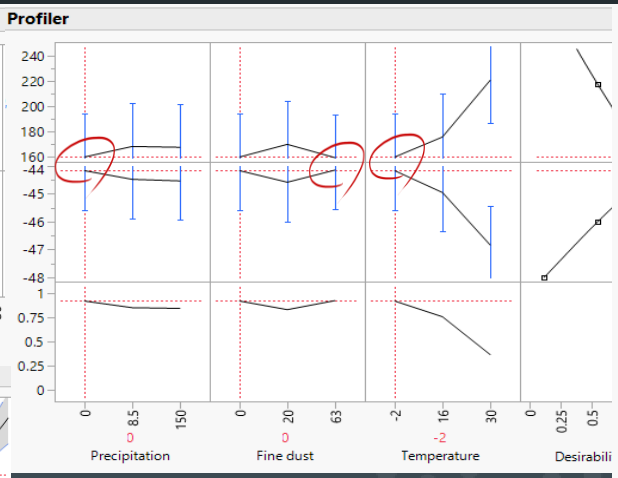
jmp

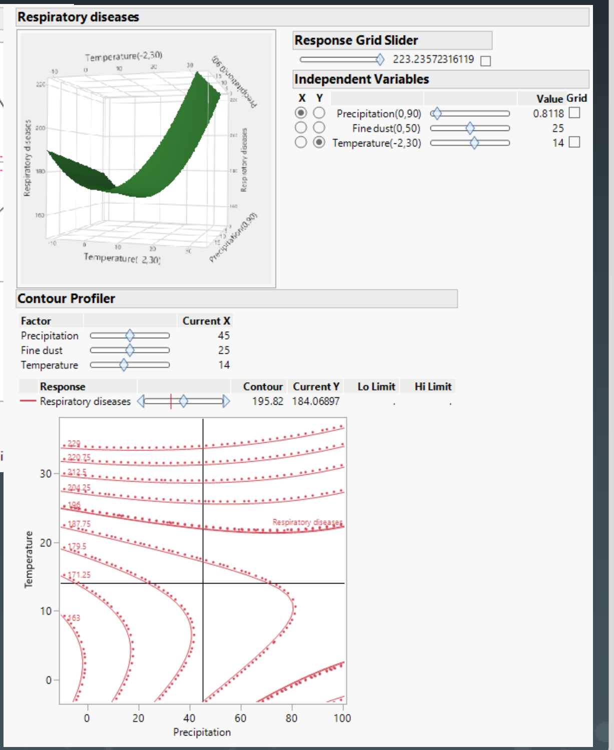
Case Examples

Category	Purpose	JMP Function used
Excursion	Problem definition	Distribution Graph builder
	RC analysis	Regression Pareto
	Risk assessment	Partition Logistic
Optimization & Improvement	**DOE**	**Fit model**
Monitoring	CCB (Change board)	Fit y by X (2sample T) 2 Proportion
	SPC	Control chart builder
	MSA	MSA Variability/Attribute Gauge Chart
Others	Automation	JMP script

- Factorial design, Taguchi, RSM
- Factorial Design : Study the effect of multiple factors (Liner effect)
- Taguchi : Minimize variation, Robustness design (Loss function)
- RSM : Identify optimal settings w/ fewer experiments. (Curvature effect)



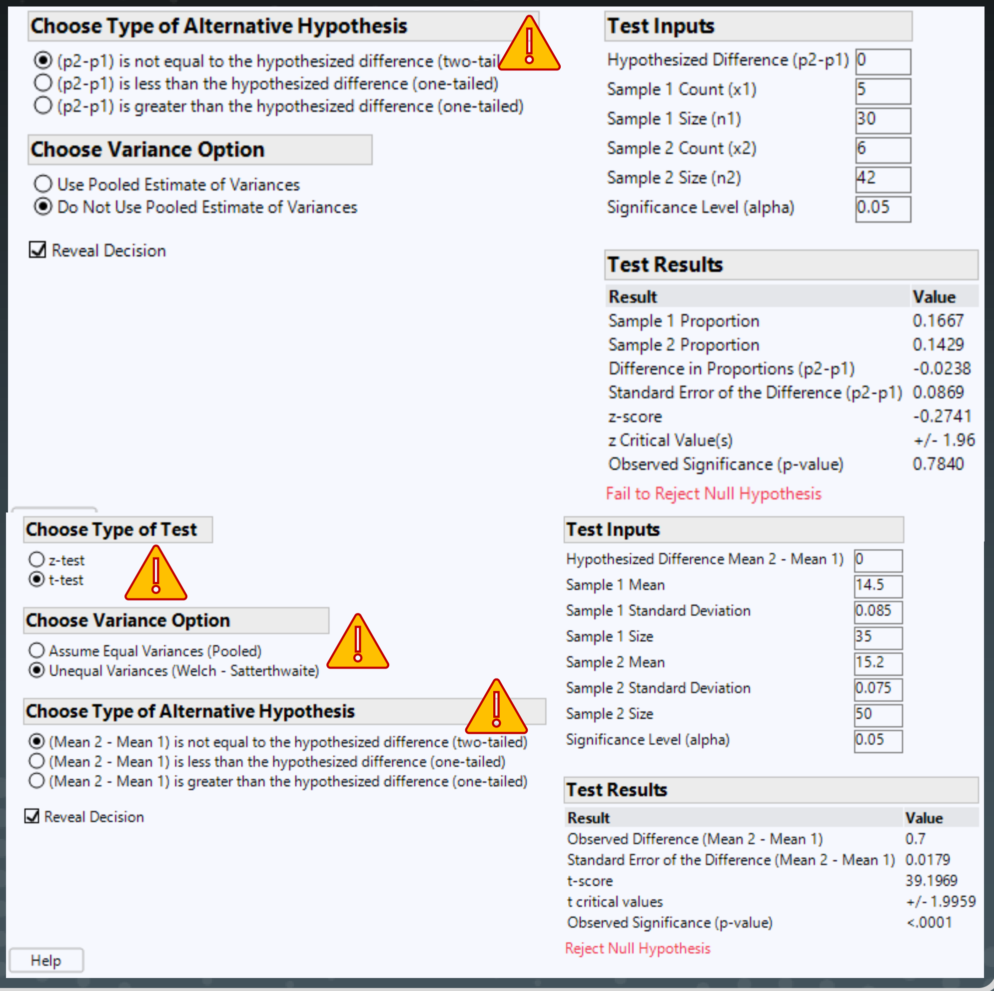




Case Examples

Category	Purpose	JMP Function used
Excursion	Problem definition	Distribution Graph builder
	RC analysis	Regression Pareto
	Risk assessment	Partition Logistic
Optimization & Improvement	DOE	Fit model
Monitoring	**CCB (Change board)**	**2sample T 2 Proportion**
	SPC	Control chart builder
	MSA	MSA Variability/Attribute Gauge Chart
Others	Automation	JMP script

- 2 proportion
  - Works even with small sample sizes
- 2 sample T
  - Simple and intuitive
  - Quantitatively assesses differences between groups



DISCOVERY SUMMIT

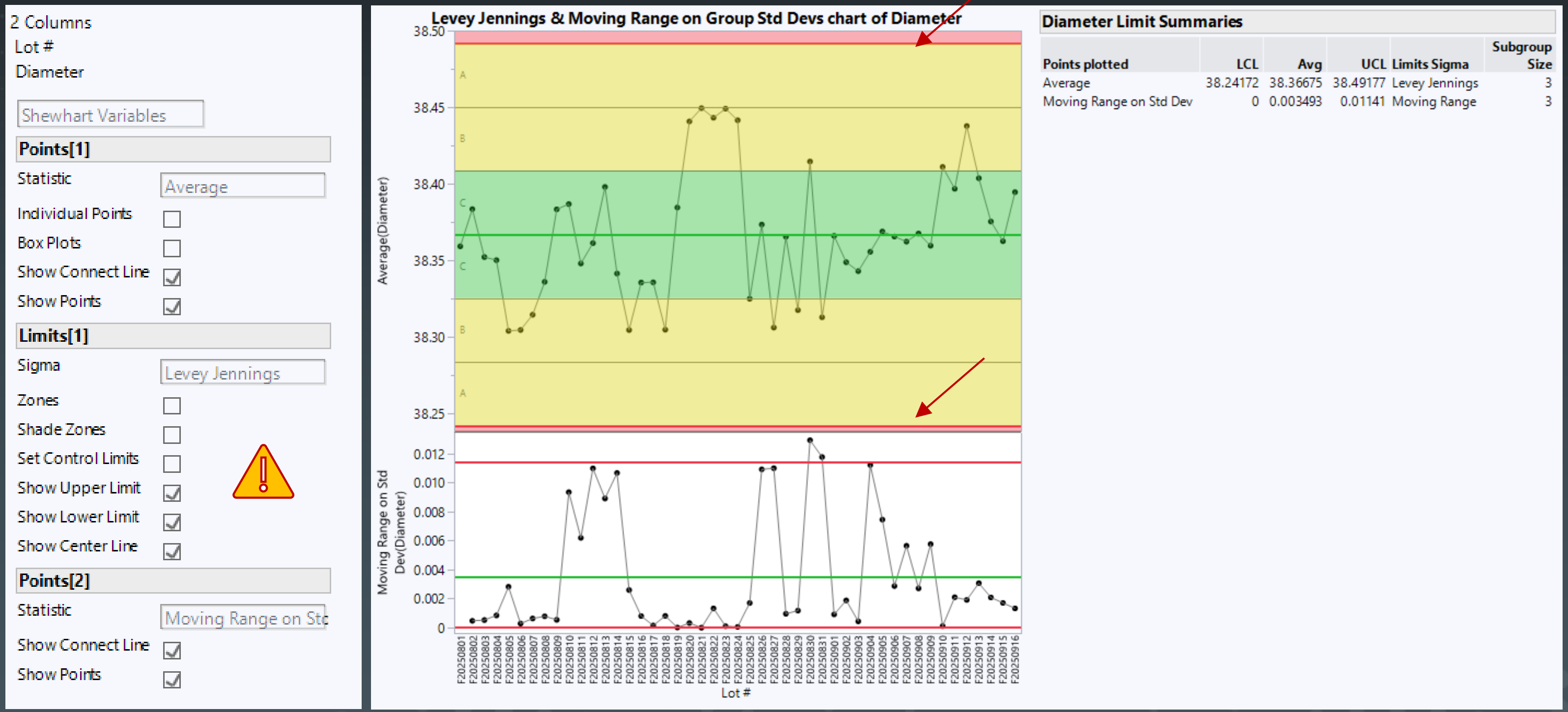
jmp

Case Examples

Category	Purpose	JMP Function used
Excursion	Problem definition	Distribution Graph builder
	RC analysis	Regression Pareto
	Risk assessment	Partition Logistic
Optimization & Improvement	DOE	Fit model
Monitoring	CCB (Change board)	Fit y by X (2sample T) 2 Proportion
	SPC	**Control chart builder**
	MSA	MSA Variability/Attribute Gauge Chart
Others	Automation	JMP script

- Control chart Graph

- Intuitive Visualization, Supports all common SPC charts: X-bar, R, S, I-MR, P, NP, C, U
- Easily customize reference lines, colors, symbols



Case Examples

Category	Purpose	JMP Function used
Excursion	Problem definition	Distribution Graph builder
	RC analysis	Regression Pareto
	Risk assessment	Partition Logistic
Optimization & Improvement	DOE	Fit model
Monitoring	CCB (Change board)	Fit y by X (2sample T) 2 Proportion
	SPC	Control chart builder
	MSA	**MSA Variability/Attribute Gauge Chart**
Others	Automation	JMP script

- GRR
  - Variable
  - Attribute
- Linearity
- Bias
- Stability

Gauge R&R

Measurement Source		Variation (6*StdDev)	% of Tolerance		which is 6*sqrt of
Repeatability	(EV)	0.0981762	0.33	Equipment Variation	V(Within)
Reproducibility	(AV)	0.0679383	0.23	Appraiser Variation	V(Op) + V(Op*Unit)
Op		0.0112527	0.04		V(Op)
Op*Unit		0.0669999	0.22		V(Op*Unit)
Gauge R&R	(RR)	0.1193908	0.40	Measurement Variation	V(Within) + V(Op) + V(Op*Unit)
Part Variation	(PV)	7.6996993	25.67	Part Variation	V(Unit)
Total Variation	(TV)	7.7006249	25.67	Total Variation	V(Within) + V(Op) + V(Op*Unit) + V(Unit)

Summary and Gauge R&R Statistics

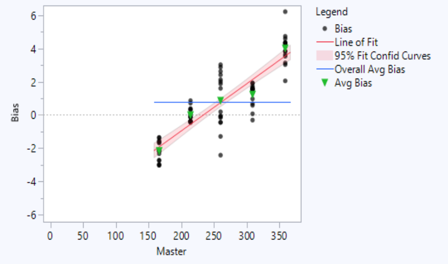
6	k
1.5504	% Gauge R&R = 100*(RR/TV)
0.01551	Precision to Part Variation = RR/PV
91	Number of Distinct Categories = Floor(sqrt(2)*(PV/RR))
5	Lower Tolerance (LT)
35	Upper Tolerance (UT)
30	Tolerance = UT-LT
0.00398	Precision/Tolerance Ratio = RR/(UT-LT)

Using last column 'Unit' for Part.

Variance Components for Gauge R&R

Component	Var Component	% of Total	20 40 60 80
Gauge R&R	0.0003959	0.024	
Repeatability	0.0002677	0.0163	
Reproducibility	0.0001282	0.0078	
Part-to-Part	1.6468158	99.98	

Linearity Study



Master	Avg Bias	Std Error	t Ratio	Prob>|t|
166	-2.1644	0.147893	-14.635	<.0001*
214	-0.0075	0.104600	-0.072	0.9438
260	0.8619	0.411737	2.093	0.0537
309	1.2300	0.163697	7.514	<.0001*
359	4.0131	0.225244	17.817	<.0001*
Overall	0.7866	0.105806	7.435	<.0001*

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	296.69690	296.697	258.0034
Error	78	89.69789	1.150	Prob > F
C. Total	79	386.39479		<.0001*

	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	-6.6187	0.476364	-13.894	<.0001*
Slope	0.0283	0.001762	16.062	<.0001*

		Which equals
Process Variation	.	6 * Historical Process Sigma
Linearity	.	abs(Slope) * Process Variation
% Linearity	2.8308	100 * Linearity / Process Variation
Overall Avg Bias	0.7866	Bias averaged over all parts
% Bias	.	100 * abs(Avg Bias) / Process Variation
Alpha	0.05	

Agreement within Raters

Rater	Number Inspected	Number Matched	Rater Score	95% Lower CI	95% Upper CI
A	12	10	83.3333	55.1969	95.3035
B	12	5	41.6667	19.3260	68.0489
C	12	8	66.6667	39.0622	86.1880

Agreement Comparisons

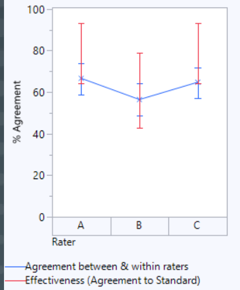
Rater	Compared with Rater	Kappa	.2 .4 .6 .8	Standard Error
A	B	0.0000		0.2033
A	C	0.2941		0.1965
B	C	-0.130		0.1988

Rater	Compared with Standard	Kappa	.2 .4 .6 .8	Standard Error
A	Standard	0.6667		0.1434
B	Standard	0.2500		0.1914
C	Standard	0.6667		0.1500

Conformance Report

Rater	P(False Alarms)	P(Misses)
A	0.1667	0.3333
B	0.2500	0.5000
C	0.0833	0.2500

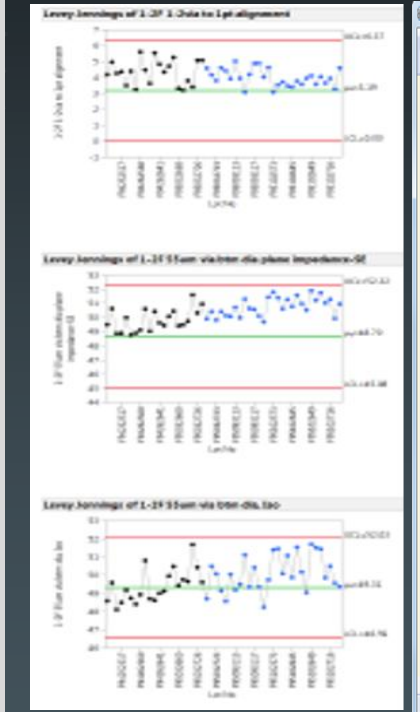
Assumptions	
NonConform =	0
Conform =	1

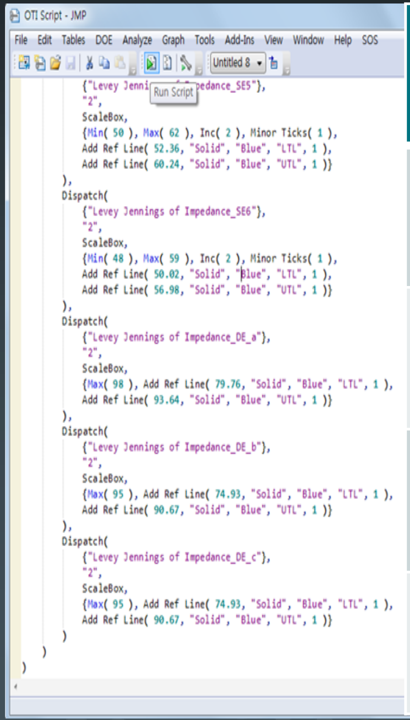


Case Examples

Category	Purpose	JMP Function used
Excursion	Problem definition	Distribution Graph builder
	RC analysis	Regression Pareto
	Risk assessment	Partition Logistic
Optimization & Improvement	DOE	Fit model
Monitoring	CCB (Change board)	Fit y by X (2sample T) 2 Proportion
	SPC	Control chart builder
	MSA	MSA Variability/Attribute Gauge Chart
Others	**Automation**	**JMP script**

- Automation by JSL : 90% ↓





Customer Requirement		Method	Effectiveness
Ascending	Shipment base	Excel to JMP (JMP Script)	12 hr → 30 min (weekly base)
Parameter#	200 items		
Control Limit	Following Customer Control limit		
Product	All product		

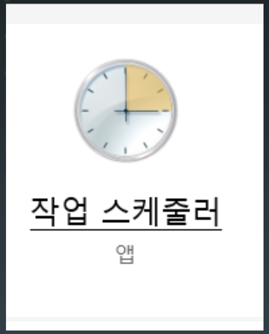
DISCOVERY SUMMIT

jmp

Case Examples

Category	Purpose	JMP Function used
Excursion	Problem definition	Distribution Graph builder
	RC analysis	Fit y by X Pareto
	Risk assessment	Partition Logistic
Optimization & Improvement	DOE	Fit model
Monitoring	CCB (Change board)	Fit y by X (2sample T) 2 Proportion
	SPC	Control chart builder
	MSA	MSA Variability/Attribute Gauge Chart
Others	Automation	JMP script

- Connection API to JMP

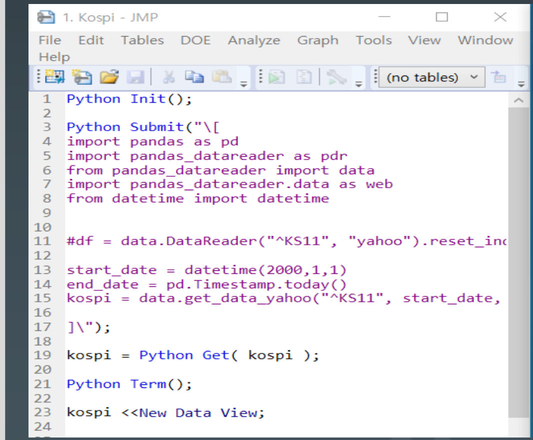


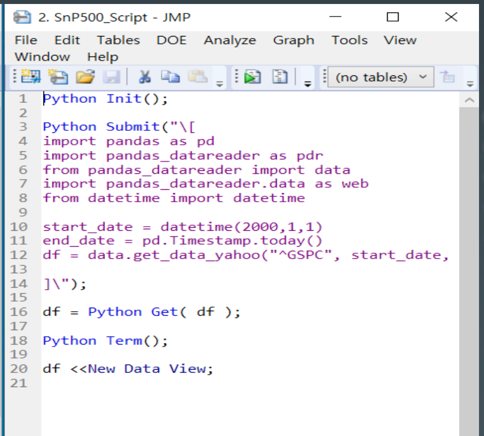
+

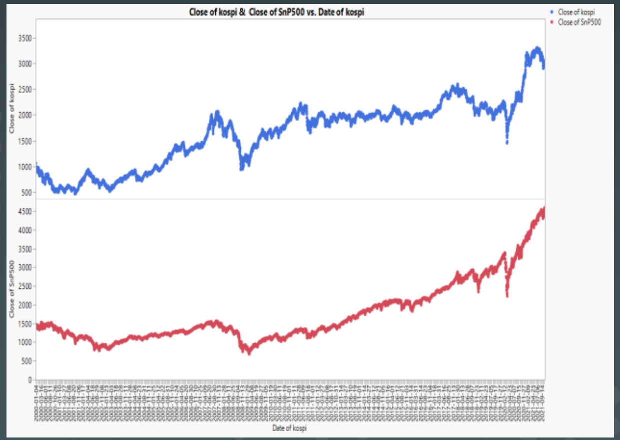
JMP Script
using python coding
w/ publish data

=

Coffee with JMP Trend







Thank you

DISCOVERY SUMMIT

jmp