

[Introduction to B-Box[™]]

Decisions

Where would be a good place move our factory?

I hear there is a statistics tool that helps with decision making...

Anyone out there who can help?

So much information, but so difficult to make a decision!

How about next year's sales volume? Shouldn't we know this to plan our production and supplies?

I hear there is a way to predict it...

Basic statistics? Regression? Time Series?

Clusters? Factor? Correlation?

So many statístical techniques... What do I do?



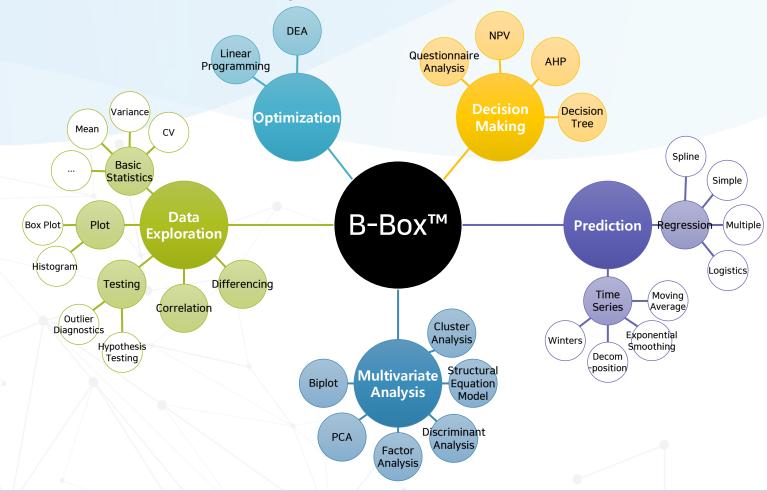
B-Box™

B-Box is an abbreviation of Black Box. We aim to improve decision making processes.



Analytic Techniques

As a decision-making support tool, we provide various statistical and operations research techniques.



Analysis of the influence of independent variables on a dependent variable (y=f(x)+e). • A number of features that help you to easily find the optimal model Recommendation of the optimal model via the "all possible models" method Alternative optimal models by transforming the x and y variables • Identification and automatic removal of outliers, and generation of regression models based on the data after the Linear Regression removal of outliers Testing of basic assumptions of linear regression analysis (normality, multicollinearity, linearity, homoscedasticity, autocorrelation) • Testing of predicting power of the model via test data, and simultaneous review of a number of models using a Z variable · Splitting of the independent variable into regions, and generation of a separate regression model for each region Model generation via manual assignment of the splitting points (knot points) on the graph Spline • Model generation via automatic calculation of the optimal knot points Regression • Immediate calculation of predicted values according to the estimated model • Simultaneous review of a number of models using a Z variable Analysis of the influence (eg. Expected probability and classification criterion) of independent variables on a categorical dependent variable (logit(π)=f(x)+e) • A number of features that help you to easily find the optimal model Recommendation of the optimal model via the "all possible models" method Logistics · Automatic identification of outliers Analysis of residuals and their scatter plot • Simultaneous review of a number of models using a Z variable • Estimate the probability (π) and its confidence interval for new data

Т	Γime Series Analysis	 Identification of characteristics and prediction of future values from a set of data observed with time-dependent. B-Box contains the moving average, exponential smoothing, decomposition and Winters models. Simultaneous execution and review of every model via the auto execution feature Immediate execution of one of the models on the "All possible" results screen for more detailed results Automatic calculation of smoothing constants in Exponential Smoothing and Winters models for user's convenience Testing of predicting power of the model via test data Simultaneous review of a number of models using a Z variable
	Cluster Analysis	 Grouping of data points which share similar characteristics Equipped with the PAM technique, a non-hierarchical method that is robust in dealing with outliers Entering a range of numbers of clusters via the All possible feature, for user's convenience Calculation of silhouette scores, and simulation of changes in silhouette scores with changes in clusters
Di	iscriminant Analysis	 Determination of the category to which a data point belongs Discriminant analysis of every possible combination of variables (all possible models) Review of the apparent error rate of every possible model and immediate execution of any one of the models to view more detailed results Categorization of new data points, and the visualization of the current categorization
	Factor Analysis	 Identification of hidden relationships between variables and grouping them Prompt results after selecting the variables and defining the number of factors Visualization of the results of rotation on a graph, for cases with 2 factors.

PCA & Biplot	 Reduction of the number of variables, to enable simpler explanation of the data Prompt results after selecting the variables Scatter plot between PCs and between PCs and observed variables, and a scree plot to determine the number of principal components to consider Biplot: visualization of the relationships between data and multidimensional variables, obtained from principal component analysis
Structural Equation Modeling	 Analysis of various causal relationships between variables in a single model Generation of variables and basic model generation, for user's convenience in defining a model Validation of the model, to check whether the model as defined is mathematically solvable Review of results at a glance via path diagrams, including the results of significance tests for the estimated coefficients
Outlier Diagnostics	 Detection of outliers by checking whether each data point falls within a specified standard deviation range from the mean Basic statistics for the variable before and after the removal of outliers Simultaneous review of a number of models using a Z variable
Hypothesis Testing	 Mean and variance tests for each variable, difference of the means, ratio of the variances and paired difference tests for two variables and difference of the means test for 3 variables Simultaneous review of a number of models using a Z variable
DEA	 Analysis of efficiency of each data point (called Decision Making Units, or DMUs, in this context) by considering input and output variables Efficiency score for each DMU, along with possible reductions in input variables and possible increases in output variables. Variables with negative values can also be considered. Introduction of the concept of super efficiency, enabling absolute evaluation of the efficiency of DMUs, as well as relative comparisons Simultaneous review of a number of models using a Z variable

LP	 Finding the optimal solution of an objective function under linear constraints, using solution algorithms for linear programs
АНР	 Determination of an order of importance between factors considered in a decision making process, and evaluation of the alternatives for each factor Placing of weights on each factor in a subjective decision making process, following Professor T. L. Satty's AHP methodology Consistency test, in order to ensure reliability of the results
NPV	 Support of financial decision making, considering the present value by discounting future cash flows to take into account the time value of money
Questionnaire Analysis	 Provide various statistics for each question and respondent group (mean, variance, cv, etc) Visualize the result of analysis by displaying plots Test on the reliability of questionnaire based on Cronbach's Alpha Test on equal mean / variance between two selected groups based hypothesis testing
Decision Tree	 Visualization of decision-making process in a tree plot using CART algorithm Variable selection feature to easily find the optimal model Recommendation of the optimal model through "All possible model" method Multiple model creations by Z variable Model validity check with test data function

B-Box™ Main Features: One Click

A single click enables you to have 7 different analyses

 Linear Regression, Time Series Analysis, Cluster Analysis, Biplot, Outlier Diagnostics, Hypothesis Testing, Correlation Analysis

To reduce the time taken, user can select the variables to use.



One Click

A single click enables you to have 7 different analyses.

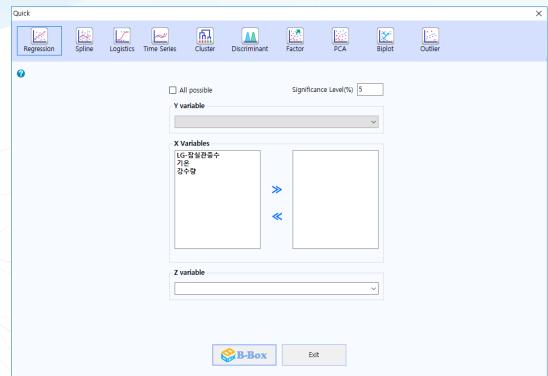
Method	Process
Linear Regression	Regression equations are calculated for every possible case, with all the variables taking turns to act as the Y variable and the other variables acting as the X variables. Then the model with the largest value of R^2 is displayed.
Time Series Analysis	Time series analysis is executed with the multiplicative Winters model, assuming all the variables to be time series data. Seasonal period is automatically set to 12.
Cluster Analysis	Cluster analysis is performed on all the selected variables. Setting the number of clusters to be in the range 2~5 and using the PAM (Partitioning Around Medoids) method, every possible model is generated, and those with average silhouette value greater than 0.5 are displayed.
Outlier Diagnostics	Outliers are detected from all the selected variables. Outliers are defined to be data points which lie outside the range mean $\pm 3\sigma$, where σ is the standard deviation of the variable.
Hypothesis Testing	Population mean tests are carried out on all variables against the null hypothesis that the population mean is 0. Difference of means tests and variance ratio tests are carried out on every possible pair of variables, against the respective null hypotheses that the difference in the means is 0 and the ratio of variances is 1.
Biplot	The eigenvectors of the first and second principal components from Principal Component Analysis are represented on biplot as blue arrows, and the principal component scores of the data points are represented on biplot as dots.

B-Box™ Main Features: Quick

You can obtain prompt results from 9 methods of analysis by setting minimal conditions.

 Linear Regression, Logistic Regression, Spline Regression, Time Series Analysis, Cluster Analysis, Discriminant Analysis, Factor Analysis, Principal Component Analysis, Biplot, Outlier Diagnostics





B-Box™ Main Features: Optimal Model

The optimal model is recommended after all possible models have been reviewed.



Choice

Best option is provided among a possible solutions.

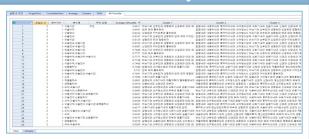
Linear Regression

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	718'05 5'05	BURGER BOTHS NO	UCIE ST		mmended	#2R	0.7214	Part prince		24646.6452			A 8.0		J1500 0047	20.00
2	기용'인수함'유일	· · · · · · · · · · · · · · · · · · ·	29,92	14		유유하지 않음	0.7469		2.3234	29369.5382	-295.3604	+174,4038	+1237.1639	3506.9639	+4437,7109	+33057
- 1	기유'강수항'유일	E-29 F-29 4-29 F	202 A	13		유의까지 않음	0.7462	0	1.5887	28519.5907	-263,2117	-183.2546		4211.7153	-3718-6818	-2165.48
4	기준 감수함 유일	보고를 하고를 수 있다면 /	100 graph	12		유인하지 않음	0.746		1.4352	28075.4487	-292.3513	-192,819		4510.3318	-9250.8287	-2149.33
- 5	기용 경수함 유일	· · · · · · · · · · · · · · · · · · ·	89.85	15		유민하지 않음	0.7459	0	2.3276	29812.2454	-291.9814	-160.2666	-1184,4188	3602.6614	-4384.9511	-3228.14
- 6		五四年,即四年,中田司司,		13		유숙하지 않음	0.7456	0		20590.4960				4504,5596	-2233,9557	-2105.7%
7		E-20年, 新古安, 中·20年, 新		14		유요까지 양봉	0.7456	0	1.9297	29027.3859					-3695.2454	
	기용'장수함'유일	보고를 하고를 수 있다면.	1999 PM	11		유의하지 않음	0.7439		1.2838	27575.052	-290.653	-209.6313		4500.5402	-3128.2801	-2148.69
- 2	기용 감수함 유일	· · · · · · · · · · · · · · · · · · ·	88.80	13.		유의하지 않음	0.7435	0	2.3137	28754.8545	-295.556	-195.5696	+1163.6361	\$547,7995	+4235.6281	-3235.84
10	기윤 강수함 요일	原名製 財名製 中名製 年	991年	12		유의까지 않음	0.7435	0	1.5854	27976.1705	-291.4542	-201.2079		4210.7154	-3565.1912	-2569.47
.11		· 查用製 斯用製 斯用製 中		1.3		유의하지 않음	0.7421	0	1.4732	20204.4631	-292.7232				-3343.9310	
1.2	기용 같으함 요일	· 母母 · 母母 · 母母 · 母母 · 中	GON. E	14		용의하지 않음	0.7415	0	1.9483	28709.1602	-289,189	178.7503	-269,8733	4476.1229	-3317,7881	-2191.12
13		LESS, F29, 429, 4		14		유요하지 않음	0.7408	0	2.301	29432.9064	-272.2861		-1298.512	3520.8393	-4512.6329	-3090.2
14		LESS, N'SS, 4'SS, 4		13		유의까지 않음	0.7399	0	2.293	20028.3773					-4593.9141	
15		,会出位,即出位,即出位,心		12		유의하지 않을	0.7399	0		27695.0814		-209.2333	-283.4654		-3215.7303	
16		医免疫 联系统 中心持续		12		유요하지 않음	0.7897	0		27624.2911		-208.2781			-3115.818	
17		建护设备,中央设备 ,等设备管		13		유요되지 않음	0.7397	0		20540.6052					-2759.607	
18		"在,因是,我,因是,今,因是,我		13		会回取礼 智管	0.7392	0		28013.804					-3552.5116	
19		· 2-12 12 12 12 12 14 15 16 16 16 16 16 16 16 16 16 16 16 16 16		14		유요하지 않을	0.7391	0		28770.8972		-193.0419	+1157.0605		-4224 9291	
20		,取名量,中设印度,前即设计		12		유인하지 않음	0.7386	0		28031.8585					-3239.723	
21		。即用量,中用量,用切印管,		12		유민까지 않습	0.7361	0		27845.2151					-3797.1049	
22		「財産製」の必可能、見句での		11		유의하지 않음	0.7867	0		27292.2809					-3262.1418	
23		· 8-58 T-58 T-58 +		1.3		유요하지 않음	0.7356	0		27738.9339		-207.9652			-3202.074	
24		1,至以至,取以至,中分以至		13		非包取利 智書	0.7344	0		20149.1107			-203.7002		-3327.0411	
25		1,822,022,022,4		12		유의하지 않을	0.7339	0		28090.4822			+1309,6051		+4375,0617	
26		一般出版。小品版,中华特別		11		유의하지 않음	0.7328	0		27117.4698					-1623.0068	
27		· 东京型、联岛型、中华印度、		12		유의하지 않음	0.7327	0	1.4482	27433.8405	-268.8921		-324.5949	4297.3758	-3362.7377	-1944.63
28		L联编纂,专业特别,是可证4		10		유교하지 않음	0.732	0		26607.1397					-3115.6853	
29		**************************************		13		유요하지 않음	0.7295	0		28071,7248			-1293,6146		-4349,7295	-3055.09
10	기류'장수함'요일	是"我是"的"你也是"你的"你也	5,89%	12		유인하지 않음	0.7293		1.8877	27729-0267	-268.5895	-133.2246		5015.9247		

Time Series Analysis

₽	A	В	C						F	G	н	1	,
1	적용모형			이용평	문법	단순지수	명활법	이중지	수명활법	본해법(가법)	본해법(숭법)	원터스(가법)	원터스(숭법)
2	결과	절대오자율(%)=:	Ejej/EjZj		43.1639		39.1945		39.4537	15.7517	18.9548	17.687	17,7715
3		MSE		2.7787	19E+013	2.5524	57E+013	2.5867	798E+013	4.888748E+012	586748E+012	724121E+012	754275E+01
4		MAE			022.875			3815	855.4625	1689263.9489			
5		MAPE(%)			62.2608		52.4289		50.1041	21,4756	23.5544		22.719
6		Hett=0	t		0.0123		1.0541		1.1909	0.2389			0.164
7			p-value		0.9902		0.2961		0.2385	0.8121	0.6415		0.869
8			결과	8=0		8=O		ε=0		s=0	s=0	8=0	s=0
9	실행조건	이동평균기간			12								
10		계절(반폭)주기								12	12	12	13
11		조기값				첫 번째 (22	첫 번호	12 8				
12		평활상수(W)					0.03		0.01				
13		평활상수	α									0	0.00
14			β									0	4
15			Y									0	
16		테스트데이터	절대오자들(%))									
			MSF										
17			MAE										
18			MAE										

Cluster Analysis



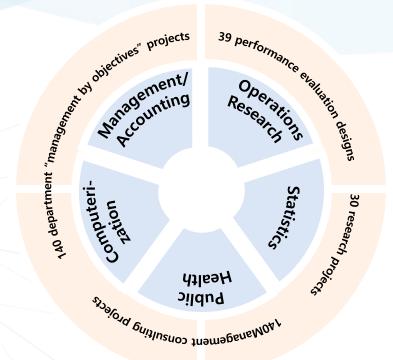
Discriminant Analysis

	X(설명변수)	오분류율(%)	추전 모형	평균탁율	평군자책점	PUTOUT	도루
1	평균타출	33.7209)			
2	평균자책점	33.7209			0		
3	PUTOUT	46.5116				0	
4	도루	43.0233					0
5	평균타율'평군자책점	8.1395	추천 0		0		
6	평균타율'PUTOUT	33.7209				0	
7	평균타율'도루	31.3953					0
8	평군자책점'PUTOUT	32.5581			0	0	
9	평균자책점'도루	30.2326			0		0
10	PUTOUT 도루	43.0233				0	0
11	평군타율'평군자책점'PUTOUT	8.1395			0	0	
12	평균타율'평군자책점'도루	9.3023			0		0
13	평균타율'PUTOUT'도루	26.7442				0	0
14	평군자책점'PUTOUT'도루	27.9070			0	0	0
15	평군타율'평군자책정'PUTOUT'도루	9.3023)	0	0	0

Caliber

This decision-making tool contains 20 years of consulting experience, in the fields including management, accounting, operations research and statistics.

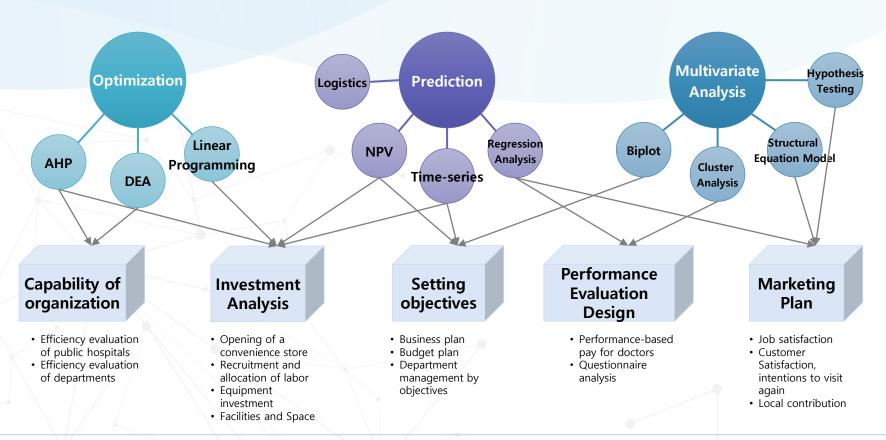
 It has been used extensively in management consulting, performance evaluation designs, department "management by objectives" projects and various policy research projects.



Case Studies

We help practical decisions to be made in a scientific manner, including investment projects or setting management objectives.

There is a wide range of practical case studies.



Education Programs

We help you to carry out scientific decision making processes by yourself.

 We aim to improve analytic capacity of members according to the needs of each organization, through various curricula.

Benefits for Students

Strengthen analytic skills

Employment and promotion opportunities

Tool is free for personal users

Various Curricula

Analysis of influencing factors and predictions via linear regression

Predictions and usage rate control via time series analysis

Survey analysis using Structural Equation Modeling

Investment decision-making based on financial analysis

Marketing plan via geographical analysis

Productivity analysis via DEA

Optimal allocation of resources via linear programming

Design of performance evaluation via statistical analysis

Benefits for Educational Institutions

Novel education program

Strengthening of practical skills

Employment insurance benefits

Purchase Guide

For personal users, B-BoxTM is provided for free.

Category	Company	Academic	Lectures (Computer labs)				
Annual license	Single-user license: 240.00 USD	Single-user license: 120.00 USD	 ► Lectures (Computer labs): Where multiple users use the same computer ► Up to 49 computers: 1000.00 USD ► Up to 99 computers: 1500.00 USD ► For 100 computers or more: 2000.00 USD 				
Technical Support	Upgrade of B-Box™ and technical support are provided without additional fees. Operating systems for which technical support can be given: (WindowXP 32/64bit, WindowVista 32/64bit, Window 7 32/64bit, Window 8 32/64bit, Window 8.1 32/64bit, V 32/64bit) For the following types of problems, we can identify the cause and guide you in solving the problem. (Technical problems in the installation process, error messages that occur during use, irregularity in operation						
Discount	10% discount is provided t VAT is not include	N/A					
Other information	chase. babc.com) or give us a call at (82-2-322-						

Decision Making



Everyone finds decision-making tough, but we all have to make decisions.

B-Box™ will guide you along the way.

We can help your decision-making

process with a single click.

