



User Guide

J-Electre-v1.0

An ELECTRE I, I_s, I_v, II, III, IV, TRI
and TRI ME software.



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1- J-Electre-v1.0 - Installation Notes

The **J-Electre-v1.0 (jar)** is a runnable .jar file that does not need to be installed and that runs in any OS. The unique requisite is the need of the latest Java SE program. Check if your computer has the latest release, if not please download it (preferably Java SE 7 or superior) at: www.oracle.com

or www.oracle.com/technetwork/pt/java/javase/downloads/index.html?ssSourceSiteId=otnes

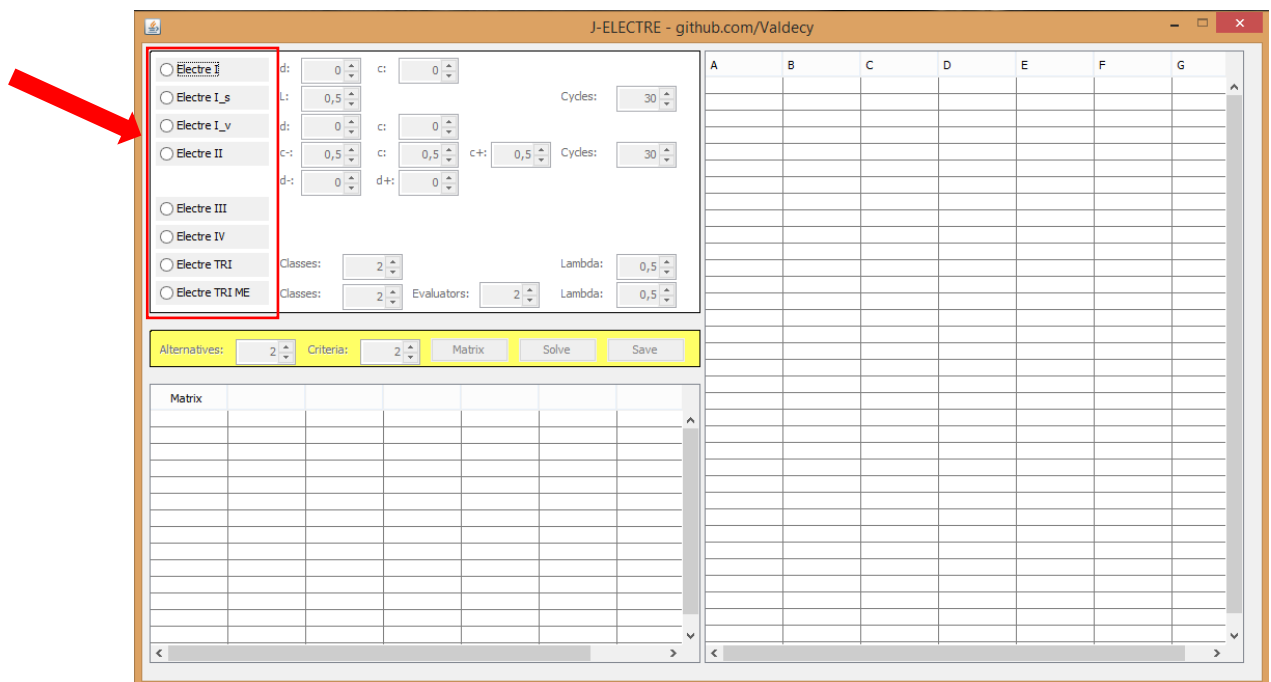
The **J-Electre-v1.0 (exe)** is a runnable .exe file that does not need to be installed and also do not need the installation of the latest Java SE program.

Download J-Electre-v1.0 at: <https://sourceforge.net/projects/j-electre/files/>

2- J-Electre-v1.0 - First Use

In the main screen choose the Electre Method between the following options:

- a) Electre I
- b) Electre I_s
- c) Electre I_v
- d) Electre II
- e) Electre III
- f) Electre IV
- g) Electre TRI
- h) Electre TRI ME (Multi-Evaluator)



2.1 Electre I

To explain how to use the **J-Electre-v1.0** in order to solve **Electre I** problems, the following example will be used:

	g1	g2	g3	g4
W	2	1	5	3
a1	150	1	20	3000
a2	300	0	10	0
a3	250	0	10	2250
a4	110	1	20	2800
a5	120	1	50	1000

This problem has 5 alternatives (*a1*, *a2*, *a3*, *a4*, *a5*) and 4 criteria (*g1*, *g2*, *g3*, *g4*). The weights (importance) of each criterion is represented by the **W** row.

After Choosing **Electre I** method, two parameters need to be set: **d** (discordance index – varying from 0 to 1) and **c** (concordance index – varying from 0 to 1). For the given example **d** = 0.6 and **c** = 0.7.

The screenshot shows the J-ELECTRE software interface. On the left, the 'Electre I' method is selected. The parameters are set as follows:

- Electre I**: $d = 0.6$, $c = 0.7$
- Electre I_s**: $L = 0.5$, Cycles: 30
- Electre I_v**: $d = 0$, $c = 0$
- Electre II**: $c = 0.5$, $c = 0.5$, $c = 0.5$, Cycles: 30
- Electre III**: $d = 0$, $d = 0$
- Electre IV**: Classes: 2, Lambda: 0.5
- Electre TRI**: Classes: 2, Evaluators: 2, Lambda: 0.5
- Electre TRI ME**: Classes: 2, Evaluators: 2, Lambda: 0.5

Below the configuration, the 'Alternatives' field is set to 2 and the 'Criteria' field is set to 2. The 'Matrix' button is highlighted. On the right, there is a large empty table with columns labeled A through G.

Insert the number of **Alternatives** (varying from 2 to 1,000), **Criteria** (varying from 2 to 1,000) and press the **Matrix** button to build the performance matrix.

The screenshot shows the J-ELECTRE software interface. The configuration is the same as in the previous screenshot. The 'Alternatives' field is now set to 5 and the 'Criteria' field is set to 4. The 'Matrix' button is highlighted. Below the configuration, a small table is visible:

Matrix	g1	g2	g3	g4
W				
a1				
a2				
a3				
a4				
a5				

On the right, the large empty table with columns labeled A through G is still present.

Insert the values in the performance matrix and then press the **Solve** button to solve the problem. To save (export) the results to a spreadsheet press the **Save** button.

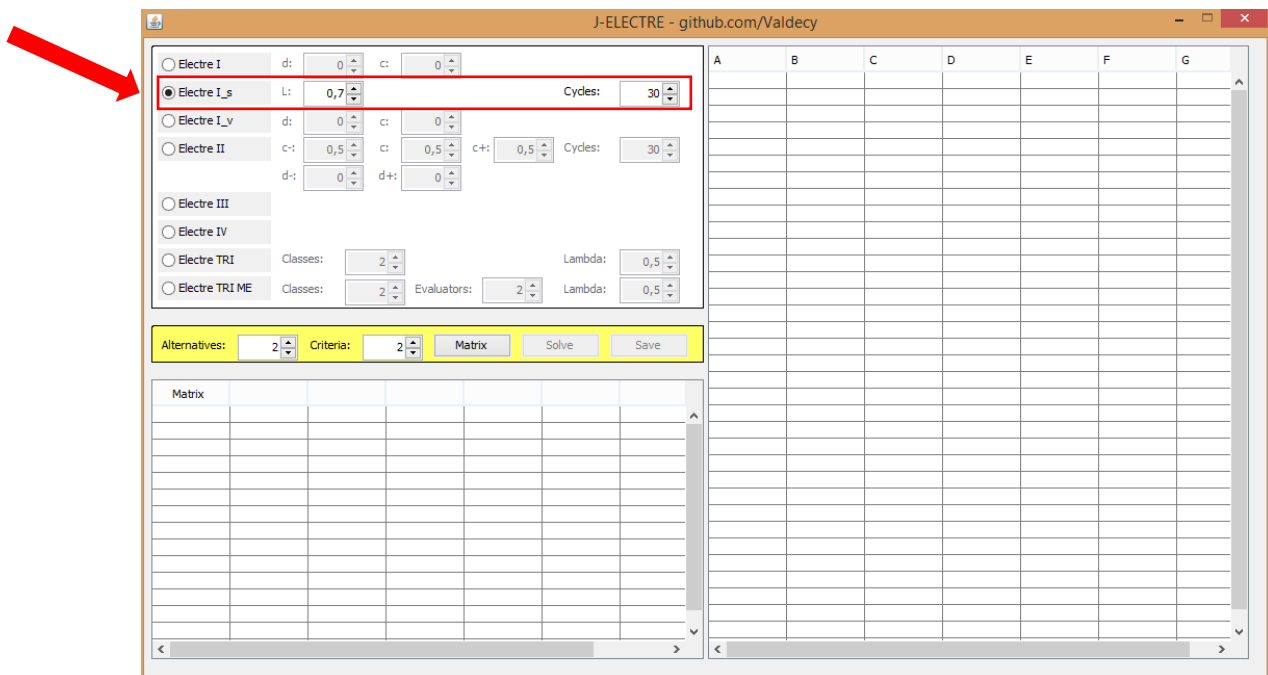
The output contains: **Concordance Matrix**, **Discordance Matrix**, **Credibility Matrix**, **Kernel** (set of alternatives that are not dominated) and **Dominated** (set of alternatives that are dominated by the alternatives in the Kernel set).

2.2 Electre I_s

To explain how to use the **J-Electre-v1.0** in order to solve **Electre I_s** problems, the following example (ROY & SKALKA, 1985) will be used:

	g1	g2	g3	g4	g5	g6	g7
Q	2000	2	1	1	1	50	0.1
P	3000	5	2	3	2	82	0.2
V	3500	7	3	5	6	90	0.5
W	0.3	0.1	0.3	0.1	0.2	0.2	0.1
a1	16000	201	8	40	5	378	31.3
a2	18000	199	8	35	5	474	33.0
a3	16000	195	8	36	1	480	33.9
a4	18000	199	8	35	5	430	33.1
a5	17000	191	8	34	1	430	34.4
a6	17000	199	8	35	4	494	32.0
a7	15000	194	8	37	3	452	33.8
a8	18000	200	8	36	6	475	33.8
a9	17000	209	7	37	3	440	30.9

This problem has 9 alternatives (*a1*, *a2*, *a3*, *a4*, *a5*, *a6*, *a7*, *a8*, *a9*) and 7 criteria (*g1*, *g2*, *g3*, *g4*, *g5*, *g6*, *g7*). The **Q** row represents the weak preference, the **P** row represents the strong



Insert the number of **Alternatives** (varying from 2 to 1,000), **Criteria** (varying from 2 to 1,000) and press the **Matrix** button to build the performance matrix.

The screenshot shows the J-ELECTRE software interface. On the left, there are configuration options for different ELECTRE methods (I, I_s, I_v, II, III, IV, TRI, TRI ME) with various parameters like d, c, L, c+, c-, d+, d-, Cycles, Classes, Evaluators, and Lambda. A red arrow points to the 'Matrix' button in the bottom left section, which is highlighted by a red box. The 'Alternatives' field is set to 9 and 'Criteria' is set to 7. To the right of the configuration panel is a large empty grid representing the performance matrix, with columns labeled A through G and rows labeled Q, P, V, W, and a1 through a9.

Insert the values in the performance matrix and then press the **Solve** button to solve the problem. To save (export) the results to a spreadsheet press the **Save** button.

The screenshot shows the J-ELECTRE software interface after solving the problem. The 'Solve' button is highlighted by a red box and a red arrow. The performance matrix is now populated with numerical values. Below the matrix, there are several output sections: 'Cycles', 'Kernel', 'Dominated', and 'Credibility Matrix'. The 'Cycles' section shows a sequence of cycles: a2 → a4 → a2; a3 → a7 → a3; and a3 → a8 → a7 → a3. The 'Kernel' section lists alternatives a1 through a9. The 'Dominated' section lists alternatives a1 through a9. The 'Credibility Matrix' is a table with rows and columns labeled a1 through a5. The 'Solve' button is highlighted by a red box and a red arrow.

Matrix	g1	g2	g3	g4	g5	g6
Q	2000	2	1	1	1	50
P	3000	5	2	3	2	82
V	3500	7	3	5	6	90
W	0.3	0.1	0.3	0.1	0.2	0.2
a1	16000	201	8	40	5	378
a2	18000	199	8	35	5	474
a3	16000	195	8	36	1	480
a4	18000	199	8	35	5	430
a5	17000	191	8	34	1	430
a6	17000	199	8	35	4	494
a7	15000	194	8	37	3	452
a8	18000	200	8	36	6	475
a9	17000	209	7	37	3	440

The output contains: **Concordance Matrix**, **Discordance Matrix**, **Credibility Matrix**, **Cycles** (first cycle: a2 → a4 → a2; second cycle: a3 → a7 → a3 and the third cycle: a3 → a8 → a7 → a3), **Kernel** (set of alternatives that are not dominated after the cycles are removed) and **Dominated** (set of alternatives that are dominated by the alternatives in the Kernel set after the cycles are removed).

2.3 Electre I_v

To explain how to use the **J-Electre-v1.0** in order to solve **Electre I_v** problems, the following example will be used:

	g1	g2	g3	g4
V	2	2	2	2
W	7	3	5	6
a1	15	9	6	10
a2	10	5	7	8
a3	22	12	1	14
a4	31	10	6	18
a5	8	9	0	9

This problem has 5 alternatives ($a1$, $a2$, $a3$, $a4$, $a5$) and 4 criteria ($g1$, $g2$, $g3$, $g4$). The **V** row represents the Veto and the weights (importance) of each criterion is represented by the **W** row.

After Choosing **Electre I_v** method, two parameters need to be set: **d** (discordance index – with only two values 0 or 1) and **c** (concordance index – varying from 0 to 1). For the given example **d** = 1 and **c** = 0.65.

The screenshot shows the J-ELECTRE software interface. A red arrow points to the 'Electre I_v' method selection. The parameters are set as follows:

- Method: **Electre I_v** (selected)
- Discordance index (**d**): 1
- Concordance index (**c**): 0.65

Other visible settings include:

- Electre I: **d**: 0, **c**: 0
- Electre I_s: **L**: 0.5
- Electre II: **c**: 0.5, **d**: 0, **c+**: 0.5, **d+**: 0
- Electre III: (empty)
- Electre IV: (empty)
- Electre TRI: **Classes**: 2, **Lambda**: 0.5
- Electre TRI ME: **Classes**: 2, **Evaluators**: 2, **Lambda**: 0.5

At the bottom, there are fields for 'Alternatives' (set to 2) and 'Criteria' (set to 2), along with buttons for 'Matrix', 'Solve', and 'Save'.

Insert the number of **Alternatives** (varying from 2 to 1,000), **Criteria** (varying from 2 to 1,000) and press the **Matrix** button to build the performance matrix.

The screenshot shows the J-ELECTRE software interface. On the left, there are several radio buttons for selecting the ELECTRE method (I, I_s, I_v, II, III, IV, TRI, TRI ME). Below these are input fields for 'Classes' and 'Lambda'. A red arrow points to the 'Alternatives' input field, which is set to 5, and the 'Criteria' input field, which is set to 4. The 'Matrix' button is also highlighted. To the right of the input fields is a large empty table with columns labeled A through G, representing the performance matrix.

Insert the values in the performance matrix and then press the **Solve** button to solve the problem. To save (export) the results to a spreadsheet press the **Save** button.

The screenshot shows the J-ELECTRE software interface after solving the problem. The 'Solve' button is highlighted with a red arrow. The performance matrix is now populated with values. Below the matrix, there are several output tables: 'Concordance Matrix', 'Discordance Matrix', 'Credibility Matrix', 'Kernel', and 'Dominated'. The 'Kernel' table shows the set of alternatives that are not dominated, and the 'Dominated' table shows the set of alternatives that are dominated by the alternatives in the Kernel set.

Matrix	g1	g2	g3	g4
W	2	2	2	2
a1	15	9	6	10
a2	10	5	7	8
a3	22	12	1	14
a4	31	10	6	18
a5	8	9	0	9

## ELECTRE I_v ##					
Concordance Matrix:					
	a1	a2	a3	a4	a5
a1	0.0	0.7619	0.2381	0.2381	1.0
a2	0.2381	0.0	0.2381	0.2381	0.571
a3	0.7619	0.7619	0.0	0.1429	1.0
a4	1.0	0.7619	0.8571	0.0	1.0
a5	0.1429	0.4286	0.0	0.0	0.0
Discordance Matrix:					
	a1	a2	a3	a4	a5
a1	0.0	0.0	1.0	1.0	0.0
a2	1.0	0.0	1.0	1.0	1.0
a3	1.0	1.0	0.0	1.0	0.0
a4	0.0	0.0	1.0	0.0	0.0
a5	1.0	1.0	1.0	1.0	0.0
Credibility Matrix:					
	a1	a2	a3	a4	a5
a1	0.0	1.0	0.0	0.0	1.0
a2	0.0	0.0	0.0	0.0	0.0
a3	1.0	1.0	0.0	0.0	1.0
a4	1.0	1.0	1.0	0.0	1.0
a5	0.0	0.0	0.0	0.0	0.0
Kernel:					
Dominated:	a1	a2	a3	a5	

The output contains: **Concordance Matrix**, **Discordance Matrix**, **Credibility Matrix**, **Kernel** (set of alternatives that are not dominated) and **Dominated** (set of alternatives that are dominated by the alternatives in the Kernel set).

2.4 Electre II

To explain how to use the **J-Electre-v1.0** in order to solve **Electre II** problems, the following example (WANG & TRIANTAPHYLLOU, 2006) will be used:

	g1	g2	g3	g4	g5	g6	g7
W	0.078	0.118	0.157	0.314	0.235	0.039	0.059
a1	1	2	1	5	2	2	4
a2	3	5	3	5	3	3	3
a3	3	5	3	5	3	2	2
a4	1	2	2	5	1	1	1
a5	1	1	3	5	4	1	5

This problem has 5 alternatives ($a1, a2, a3, a4, a5$) and 7 criteria ($g1, g2, g3, g4, g5, g6, g7$). The weights (importance) of each criterion is represented by the **W** row.

After Choosing **Electre II** method, six parameters need to be set: three levels of concordance index c^- , c and c^+ (where $0.5 \leq c^- \leq c \leq c^+ \leq 1$), two levels of discordance d^- and d^+ (where $0 \leq d^- \leq d^+ \leq 1$), and the maximum number of **Cycles** (varying from 0 to 9,000) that will be removed.

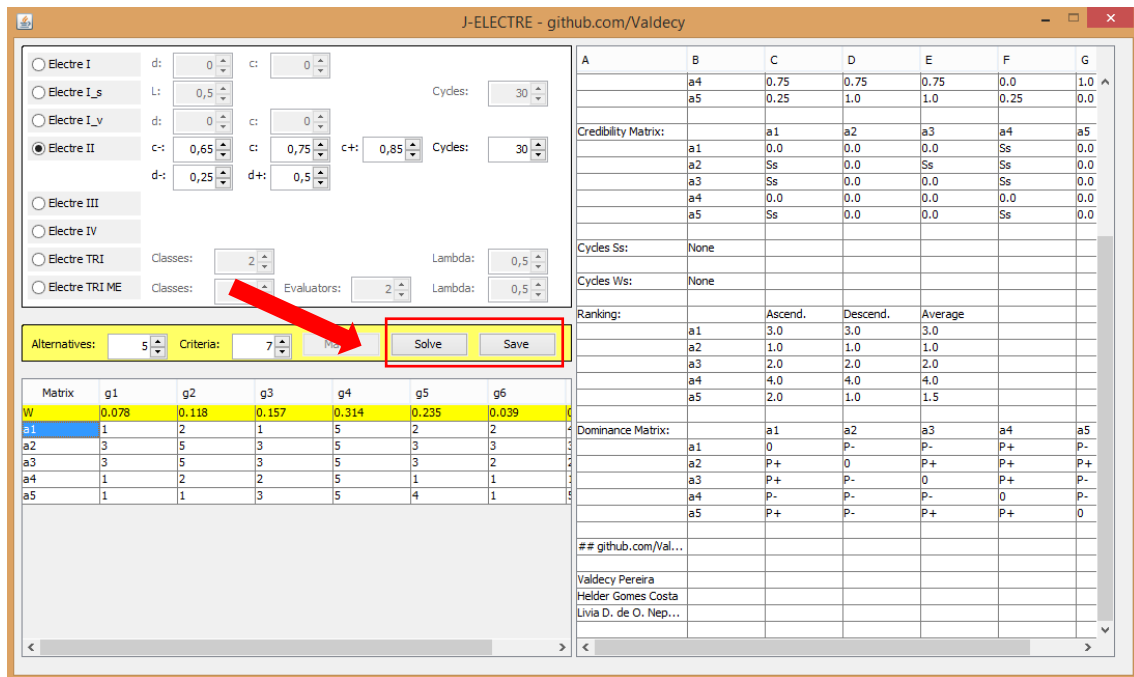
Cycles invalidate the solution obtained by the **Electre II** algorithm, and in order to deal with cycles we used the Johnson Algorithm (JOHNSON, 1975), implemented by Meyer (2012) and modified by us, that can find all cycles in a directed graph. Then we remove each found cycle in order to have a valid solution.

However, if a problem has too many cycles, as a rule of thumb above 30, consider first increasing the parameters values and if there still too many cycles, consider removing an alternative (or alternatives – one at a time) that appears frequently in most cycles (all cycles are indicated in the output table and detecting them should not be difficult).

For the given example $c^- = 0.65$, $c = 0.75$, $c^+ = 0.85$, $d^- = 0.25$, $d^+ = 0.5$ and **Cycles** = 30.



Insert the values in the performance matrix and then press the **Solve** button to solve the problem. To save (export) the results to a spreadsheet press the **Save** button.



The output contains: **Concordance Matrix**, **Discordance Matrix**, **Credibility Matrix**, **Cycles Ss** (cycles from the strong graph), **Cycles Ws** (cycles from the weak graph), **Ranking Ascending** (from the worst alternative to the best), **Ranking Descending** (from the best alternative to the worst), **Ranking Average** (In order to have a complete ranking, we choose to build the final ranking as an average between the ascending and descending ranking) and **Dominance Matrix** (To build the classical pre-ordination or final ranking, the dominance matrix is provided)

2.5 Electre III

To explain how to use the **J-Electre-v1.0** in order to solve **Electre III** problems, the following example will be used:

	g1	g2	g3	g4
Q	0.3	0.3	0.3	0.3
P	0.5	0.5	0.5	0.5
V	0.7	0.7	0.7	0.7
W	0.2754741	0.2735455	0.1758277	0.2221151
a1	8.84	8.79	6.43	6.95
a2	8.57	8.51	5.47	6.91
a3	7.76	7.75	5.34	8.76
a4	7.97	9.12	5.93	8.09
a5	9.03	8.97	8.19	8.1
a6	7.41	7.87	6.77	7.23

This problem has 6 alternatives (*a1*, *a2*, *a3*, *a4*, *a5*, *a6*) and 4 criteria (*g1*, *g2*, *g3*, *g4*). The **Q** row represents the weak preference (as constants), the **P** row represents the strong preference (as

constants), the **V** row represents the Veto (respecting: $V \geq P \geq Q$) and finally, the weights (importance) of each criterion is represented by the **W** row.

Insert the number of **Alternatives** (varying from 2 to 1,000), **Criteria** (varying from 2 to 1,000) and press the **Matrix** button to build the performance matrix.

The screenshot shows the J-ELECTRE software interface. On the left, there are configuration options for different ELECTRE methods (I, I_s, I_v, II, III, IV, TRI, TRI ME). Below these, there are input fields for 'Alternatives' (set to 6), 'Criteria' (set to 4), and buttons for 'Matrix', 'Solve', and 'Save'. A red arrow points to the 'Matrix' button. To the right of the configuration panel is a large empty table with columns labeled A through G, intended for the performance matrix.

Insert the values in the performance matrix and then press the **Solve** button to solve the problem. To save (export) the results to a spreadsheet press the **Save** button.

The screenshot shows the J-ELECTRE software interface after solving the problem. The 'Solve' button is highlighted with a red arrow. The performance matrix (W) is now populated with values. To the right, several output matrices are displayed: Credibility Matrix, Ranking (Ascending, Descending, Average), and Dominance Matrix. The performance matrix (W) is as follows:

Matrix	g1	g2	g3	g4
Q	0.3	0.3	0.3	0.3
P	0.5	0.5	0.5	0.5
V	0.7	0.7	0.7	0.7
W	0.2754741	0.2735455	0.1758277	0.2221151
a1	8.84	8.79	6.43	6.95
a2	8.57	8.51	5.47	6.91
a3	7.76	7.75	5.34	8.76
a4	7.97	9.12	5.93	8.09
a5	9.03	8.97	8.19	8.1
a6	7.41	7.87	6.77	7.23

The Credibility Matrix is as follows:

	a1	a2	a3	a4	a5
a1	0.0	1.0	0.0	0.0	0.0
a2	0.0	0.0	0.0	0.0	0.0
a3	0.0	0.0	0.0	0.0	0.0
a4	0.0	0.7091	0.4895	0.0	0.0
a5	1.0	1.0	0.6527	1.0	0.0
a6	0.0	0.0	0.0	0.0	0.0

The Ranking (Average) is as follows:

	Ascend.	Descend.	Average
a1	3.0	2.0	2.5
a2	4.0	4.0	4.0
a3	2.0	4.0	3.0
a4	3.0	3.0	3.0
a5	1.0	1.0	1.0
a6	4.0	4.0	4.0

The Dominance Matrix is as follows:

	a1	a2	a3	a4	a5
a1	0	P+	R	P+	P-
a2	P-	0	P-	P-	P-
a3	R	P+	0	R	P-
a4	P-	P+	R	0	P-
a5	P+	P+	P+	P+	0
a6	P-	I	P-	P-	P-

The output contains: **Concordance Matrix**, **Discordance Matrix** (one for each criterion), **Credibility Matrix**, **Ranking Ascending** (from the worst alternative to the best), **Ranking Descending** (from the best alternative to the worst), **Ranking Average** (In order to have a complete ranking, we choose to build the final ranking as an average between the ascending

and descending ranking) and **Dominance Matrix** (To build the classical pre-ordination or final ranking, the dominance matrix is provided)

2.6 Electre IV

To explain how to use the **J-Electre-v1.0** in order to solve **Electre IV** problems, the following example will be used:

	g1	g2	g3	g4	g5	g6	g7	g8
Q	10	10	10	10	10	10	10	10
P	20	20	20	20	20	20	20	20
V	100	100	100	100	100	100	100	100
a1	15	80	60	30	60	50	60	70
a2	25	0	40	30	40	40	50	140
a3	25	0	50	30	40	40	50	140
a4	25	0	50	30	50	40	70	140
a5	25	0	50	30	50	40	50	140
a6	15	20	50	30	50	60	60	100
a7	15	80	50	50	40	90	60	100

This problem has 7 alternatives (*a1, a2, a3, a4, a5, a6, a7*) and 8 criteria (*g1, g2, g3, g4, g5, g6, g7, g8*). The **Q** row represents the weak preference, the **P** row represents the strong preference, the **V** row represents the Veto (respecting: $V \geq P \geq Q$).

Insert the number of **Alternatives** (varying from 2 to 1,000), **Criteria** (varying from 2 to 1,000) and press the **Matrix** button to build the performance matrix.

The screenshot shows the J-ELECTRE software interface. The configuration panel on the left has the following settings:

- Electre I: ☐
- Electre I_s: ☐
- Electre I_v: ☐
- Electre II: ☐
- Electre III: ☐
- Electre IV: ☒**
- Electre TRI: ☐
- Electre TRI ME: ☐

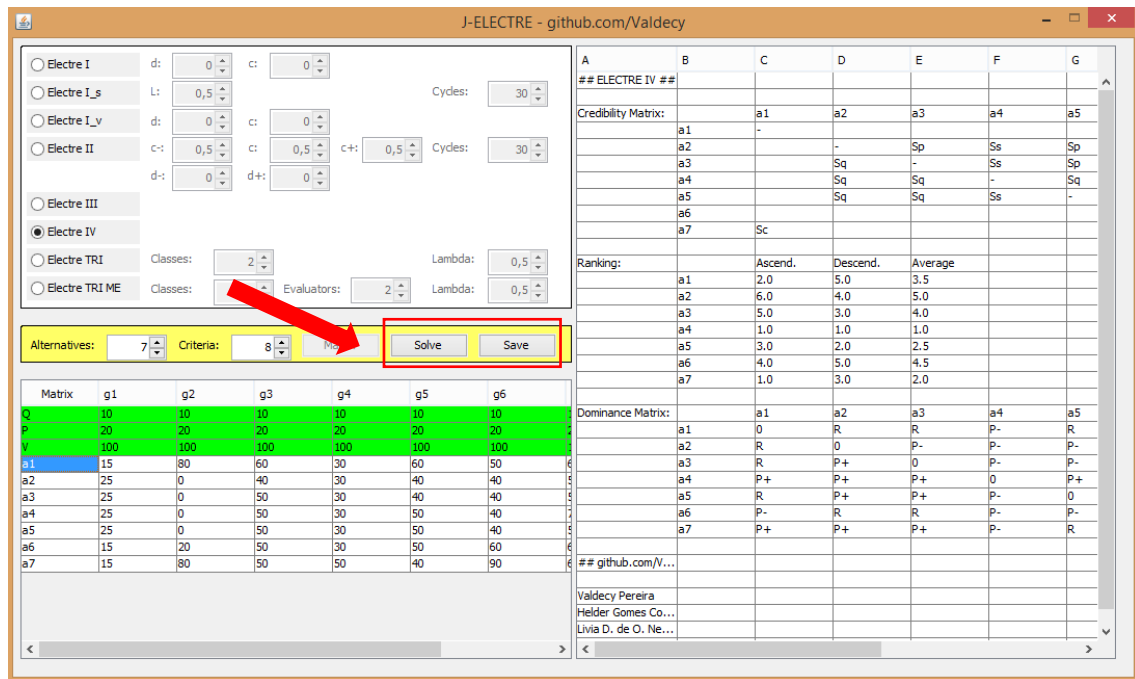
Parameters for Electre IV:

- Classes: 2
- Evaluators: 2
- Lambda: 0,5
- Cycles: 30

At the bottom of the configuration panel, the 'Alternatives' field is set to 7, the 'Criteria' field is set to 8, and the 'Matrix' button is highlighted with a red box and a red arrow. The 'Solve' and 'Save' buttons are also visible.

The main window displays a table with columns A through G. The first row (Q) is highlighted in green, corresponding to the weak preference row in the example table.

Insert the values in the performance matrix and then press the **Solve** button to solve the problem. To save (export) the results to a spreadsheet press the **Save** button.



The output contains: **Credibility Matrix**, **Ranking Ascending** (from the worst alternative to the best), **Ranking Descending** (from the best alternative to the worst), **Ranking Average** (In order to have a complete ranking, we choose to build the final ranking as an average between the ascending and descending ranking) and **Dominance Matrix** (To build the classical pre-ordination or final ranking, the dominance matrix is provided)

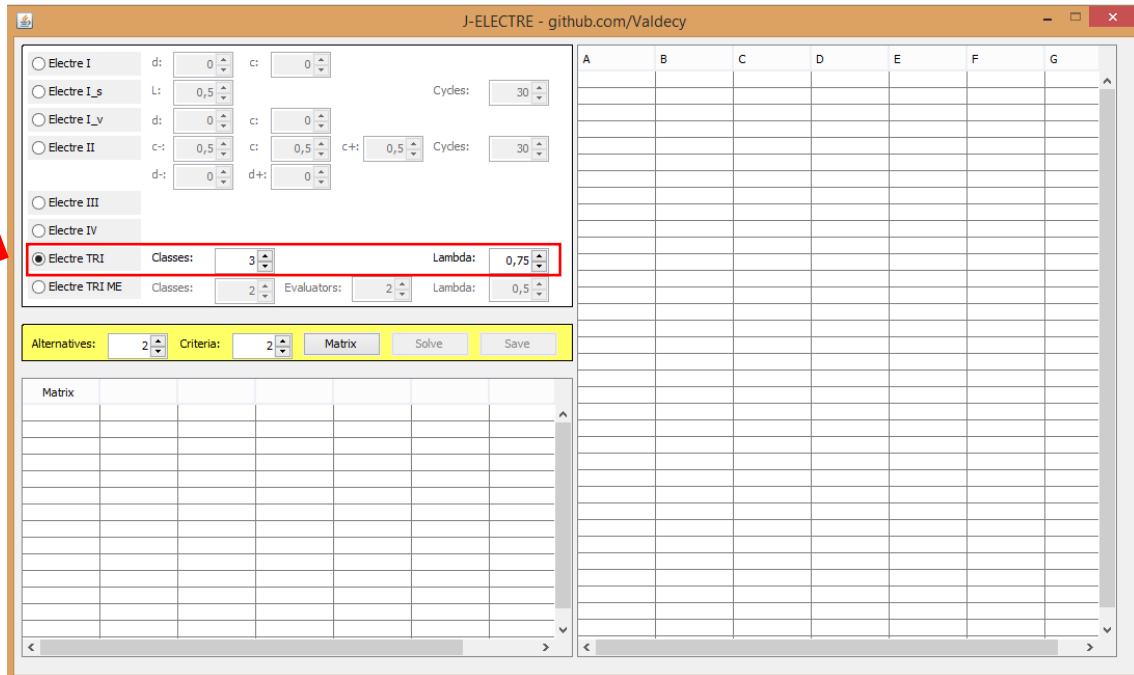
2.7 Electre TRI

To explain how to use the **J-Electre-v1.0** in order to solve **Electre TRI** problems, the following example (MOUSSEAU, 1999.) will be used:

	g1	g2	g3	g4	g5
b2	70	75	80	75	85
b1	50	48	55	55	60
Q	5	5	5	5	5
P	10	10	10	10	10
V	30	30	30	30	30
W	1	1	1	1	1
a1	75	67	85	82	90
a2	28	35	70	90	95
a3	45	60	55	68	60

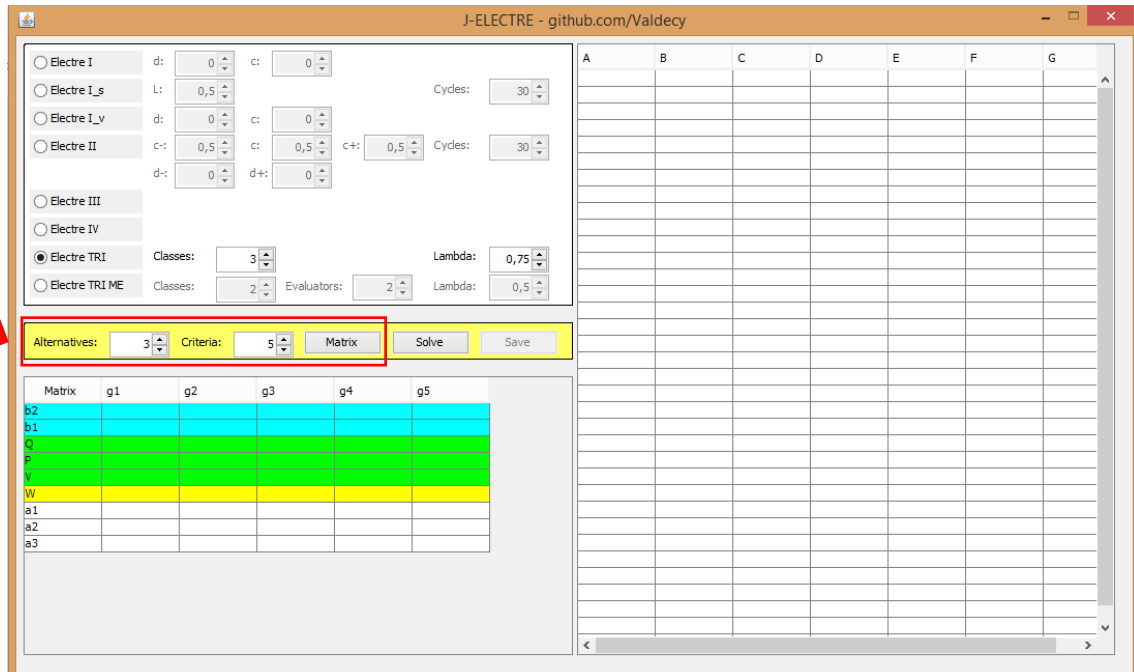
This problem has 3 alternatives ($a1, a2, a3, a4, a5$) and 4 criteria ($g1, g2, g3, g4$). The **bn** rows represents the profiles (respecting: $b_n \geq b_{n-1}$). The **Q** row represents the weak preference, the **P** row represents the strong preference, the **V** row represents the Veto (respecting: $V \geq P \geq Q$) and finally, the weights (importance) of each criterion is represented by the **W** row.

After Choosing **Electre TRI** method, two parameters need to be set: **Classes** (the total number of classes – varying from 2 to 100) and **Lambda** (cut-off level – varying from 0.5 to 1). For the given example **Classes** = 3 (hence we have two profiles: b2 and b1) and **Lambda** = 0.75.



The screenshot shows the J-ELECTRE software interface. On the left, there are several radio buttons for different methods: Electre I, Electre I_s, Electre I_v, Electre II, Electre III, Electre IV, **Electre TRI** (selected), and Electre TRI ME. Below these, there are input fields for 'Classes' (set to 3) and 'Lambda' (set to 0.75). There are also 'Cycles' input fields set to 30. A red arrow points to the 'Electre TRI' radio button. Below the configuration options, there are buttons for 'Alternatives' (set to 2), 'Criteria' (set to 2), 'Matrix', 'Solve', and 'Save'. The 'Matrix' button is highlighted. On the right, there is a large empty grid for the performance matrix, with columns labeled A through G.

Insert the number of **Alternatives** (varying from 2 to 1,000), **Criteria** (varying from 2 to 1,000) and press the **Matrix** button to build the performance matrix.



The screenshot shows the J-ELECTRE software interface. On the left, the 'Electre TRI' radio button is selected. The 'Classes' parameter is set to 3 and 'Lambda' is set to 0.75. The 'Cycles' input field is set to 30. A red arrow points to the 'Alternatives' input field, which is set to 3. The 'Criteria' input field is set to 5. The 'Matrix' button is highlighted. Below the configuration options, there is a table for the performance matrix. The table has columns for 'Matrix', 'g1', 'g2', 'g3', 'g4', and 'g5'. The rows are labeled with alternatives: b2, b1, Q, P, V, W, a1, a2, and a3. The cells for b2, b1, Q, P, V, and W are highlighted in yellow, while the cells for a1, a2, and a3 are white. On the right, there is a large empty grid for the performance matrix, with columns labeled A through G.

Insert the values in the performance matrix and then press the **Solve** button to solve the problem. To save (export) the results to a spreadsheet press the **Save** button.

The output contains: **Concordance $c(ai;bh)$** – (global concordance between alternative i and profile h), **Concordance $c(bh;ai)$** – (global concordance between profile h and alternative i), **Discordance $d(ai;bh)$** – (global discordance between alternative i and profile h), **Discordance $d(bh;ai)$** – (global discordance between profile h and alternative i), **Credibility Matrix**, **Classification Pessimist** (from the upper profile bn to $b1$, Class $A > B > C...$), **Classification Optimist** (from the lower profile $b1$ to bn , Class $A > B > C...$).

2.8 Electre TRI ME

To explain how to use the **J-Electre-v1.0** in order to solve **Electre TRI ME** problems (developed by Livia Dias Nepomuceno and Helder Gomes Costa), the following example will be used:

	EV1(g1)	EV1(g2)	EV1(g3)	EV2(g1)	EV2(g2)	EV2(g3)
b2	2	3	3	3	3	2
b1	1	2	2	1	2	1
Q	0	0	0	0	0	0
P	0	0	0	0	0	0
V	5	5	5	5	5	5
W	0.1	0.2	0.2	0.3	0.3	0.1
a1	2	2	1	3	1	3
a2	0	2	1	0	0	0
a3	1	3	3	2	1	1

This problem has 3 alternatives ($a1$, $a2$, $a3$), 3 criteria ($g1$, $g2$, $g3$, $g4$) and two Evaluators ($EV1$, $EV2$). Each evaluator judges the same set of criteria and have their own set of weights (which may be the same). The bn rows represents the profiles (respecting: $b_n \geq b_{n-1}$). The Q row represents the weak preference, the P row represents the strong preference, the V row

After Choosing **Electre TRI ME** method, three parameters need to be set: **Classes** (the total number of classes – varying from 2 to 100), Evaluators (the total number of evaluators, judges or decision makers – varying from 2 to 100) and **Lambda** (cut-off level – varying from 0.5 to 1). For the given example **Classes** = 3 (hence we have two profiles: b2 and b1), **Evaluators** = 2 and **Lambda** = 0.75.



J-ELECTRE - github.com/Valdecy

☐ Electre I
☐ Electre I_s
☐ Electre I_v
☐ Electre II
☐ Electre III
☐ Electre IV
☐ Electre TRI
☒ Electre TRI ME

d: 0, L: 0,5, Cycles: 30
 c: 0, c+: 0,5, c-: 0,5, d+: 0, d-: 0
 Classes: 2, Lambda: 0,5
 Classes: 3, Evaluators: 2, Lambda: 0,75

Alternatives: 3, Criteria: 3, Matrix, Solve, Save

Matrix	EV1(g1)	EV1(g2)	EV1(g3)	EV2(g1)	EV2(g2)	EV2(g3)
b2						
b1						
Q						
P						
V						
W						
a1						
a2						
a3						

☐ Electre I

☐ Electre I_s

☐ Electre I_v

☐ Electre II

☐ Electre III

☐ Electre IV

☐ Electre TRI

☒ Electre TRI ME

d:

L:

c:

c+:

d+:

d-:

Classes:

Evaluators:

Cycles:

Lambda:

Lambda:

Alternatives:

Criteria:

Matrix	EV1(g1)	EV1(g2)	EV1(g3)	EV2(g1)	EV2(g2)	EV2(g3)
b2	2	3	3	3	3	2
b1	1	2	2	1	2	1
Q	0	0	0	0	0	0
P	0	0	0	0	0	0
Y	5	5	5	5	5	5
W	0.1	0.2	0.2	0.3	0.3	0.1
a1	2	2	1	3	1	3
a2	0	2	1	0	0	0
a3	1	3	3	2	1	1

A	B	C	D	E	F	G
Discordance d(ai,bj):		EV1(g1)	EV1(g2)	EV1(g3)	EV2(g1)	EV
	d(a1;b2)	0.0	0.2	0.4	0.0	0.0
	d(a2;b2)	0.4	0.2	0.4	0.6	0.0
	d(a3;b2)	0.2	0.0	0.0	0.2	0.0
	d(a1;b1)	0.0	0.0	0.2	0.0	0.0
	d(a2;b1)	0.2	0.0	0.2	0.2	0.0
	d(a3;b1)	0.0	0.0	0.0	0.0	0.0
Discordance d(bj,ai):		EV1(g1)	EV1(g2)	EV1(g3)	EV2(g1)	EV
	d(b2;a1)	0.0	0.0	0.0	0.0	0.0
	d(b2;a2)	0.0	0.0	0.0	0.0	0.0
	d(b2;a3)	0.0	0.0	0.0	0.0	0.0
	d(b1;a1)	0.2	0.0	0.0	0.4	0.0
	d(b1;a2)	0.0	0.0	0.0	0.0	0.0
	d(b1;a3)	0.0	0.2	0.2	0.2	0.0
Credibility:		(ai,bj)	(bj,ai)			
	cr(a1;b2)	0.8333	cr(b2;a1)	2.5		
	cr(a2;b2)	0.0	cr(b2;a2)	5.0		
	cr(a3;b2)	0.0	cr(b2;a3)	3.3333		
	cr(a1;b1)	2.5	cr(b1;a1)	1.6667		
	cr(a2;b1)	0.0	cr(b1;a2)	4.1667		
	cr(a3;b1)	2.5	cr(b1;a3)	0.8333		
Classification:		Alternative	Pessimist	Optmist		
	a1	A		A		
	a2	C		C		
	a3	B		B		
## github.com/Valid...						
Valdecy Pereira						
Helder Gomes Costa						
Livia D. de O. Nepo...						

The output contains: **Concordance $c(ai;bh)$** – (global concordance between alternative i and profile h), **Concordance $c(bh;ai)$** – (global concordance between profile h and alternative i), **Discordance $d(ai;bh)$** – (global discordance between alternative i and profile h), **Discordance $d(bh;ai)$** – (global discordance between profile h and alternative i), **Credibility Matrix**, **Classification Pessimist** (from the upper profile bn to $b1$, Class A > B > C...), **Classification Optimist** (from the lower profile $b1$ to bn , Class A > B > C...).

3- References

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