Calculation and graphic work on the theory of decision-making

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Variant : 57

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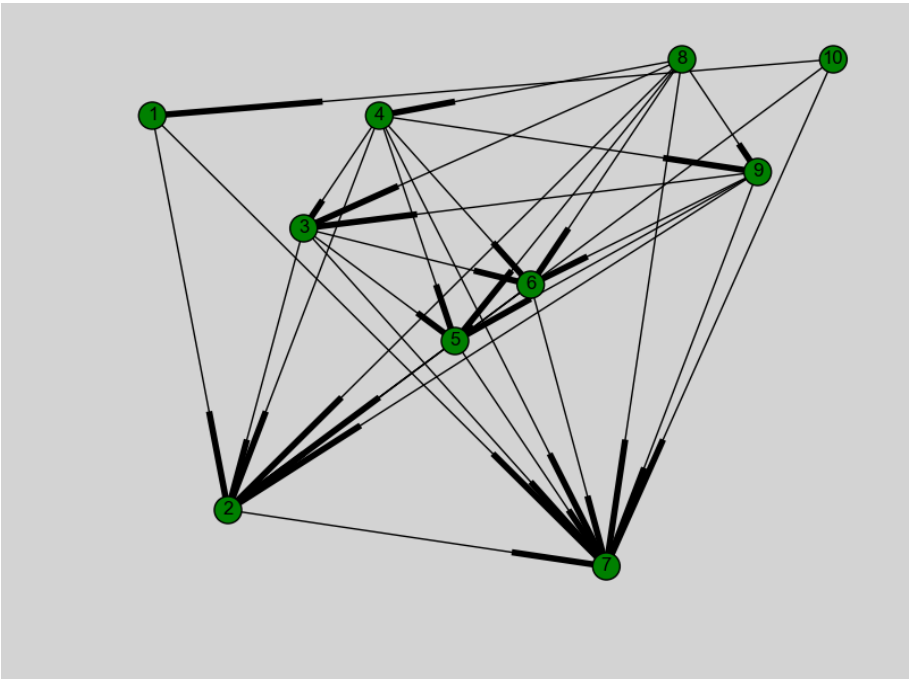
Abstract. On the set of alternatives Omega given ratio of benefits R presented by adjacency matrix

1	1	0	0	0	0	1	0	0	0
0	1	0	0	0	0	1	0	0	0
0	1	1	0	1	1	1	0	0	0
0	1	1	1	1	1	1	0	1	0
0	1	0	0	1	0	1	0	0	0
0	1	0	0	1	1	1	0	0	0
0	0	0	0	0	0	1	0	0	0
0	1	1	1	1	1	1	1	1	0
0	1	1	0	1	1	1	0	1	0
1	1	0	0	0	0	1	0	0	1

Table 1. Adjacency matrix of relation R

Exercise 1. Build graph of ratio



Picture 1. Graph of ratio R

Exercise 2. Analyze given ration : set its properties and attributed to a known class if It's possible

Reflective	True
Anti-reflective	False
Symmetric	False
Asymmetric	False
Anti-symmetric	True
Transitive	True
Anti-Transitive	False
Acyclic	False
Connected	False
Weak Connected	False

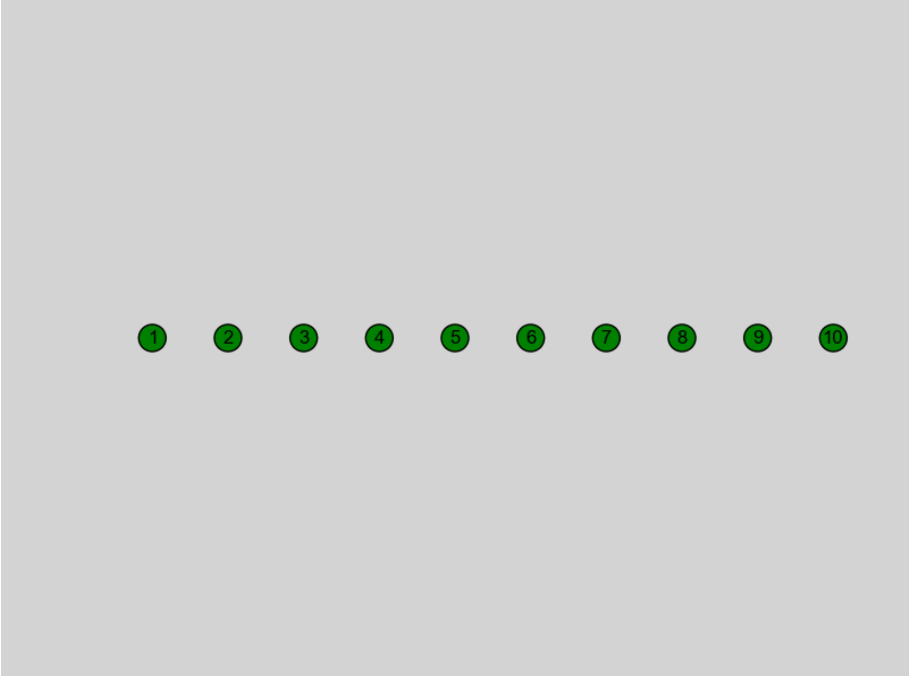
Table 2. Analysis of relation R

Ratio type : Given Ratio of advantages R is of type ***Non-strict order***

Exercise 3. Build asymmetric P(R), symmetric I(R) parts of ratio, ratio of non-comparability N(R) from R, analyze given ratios

1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0

Table 3. Adjacency matrix of Symmetric part of relation R



Pic 2. Symmetric part of R ratio

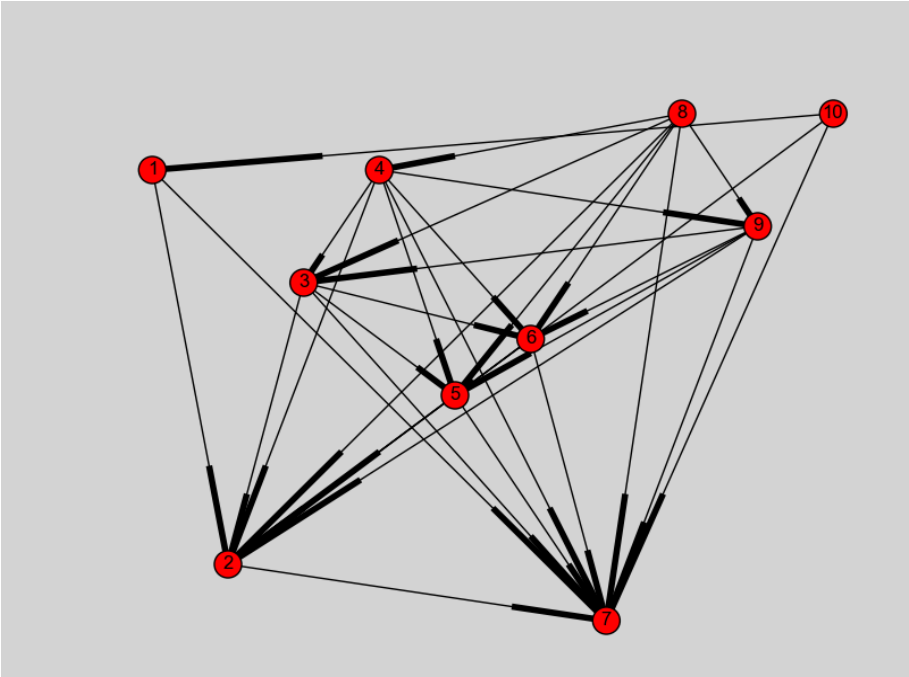
Reflective	True
Anti-reflective	False
Symmetric	True
Asymmetric	False
Anti-symmetric	False
Transitive	True
Anti-Transitive	False
Acyclic	False
Connected	False
Weak Connected	False

Table 4. Analysis of Symmetric part of relation R

Ratio type : Given Symmetric part of Ratio R is of type ***Equality***

0.0	1.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0
0.0	1.0	0.0	0.0	1.0	1.0	1.0	0.0	0.0	0.0
0.0	1.0	1.0	0.0	1.0	1.0	1.0	0.0	1.0	0.0
0.0	1.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0
0.0	1.0	0.0	0.0	1.0	0.0	1.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	1.0	0.0
0.0	1.0	1.0	0.0	1.0	1.0	1.0	0.0	0.0	0.0
1.0	1.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0

Table 5. Adjacency matrix of Asymmetric part of relation R



Pic 3. Asymmetric part of R ratio

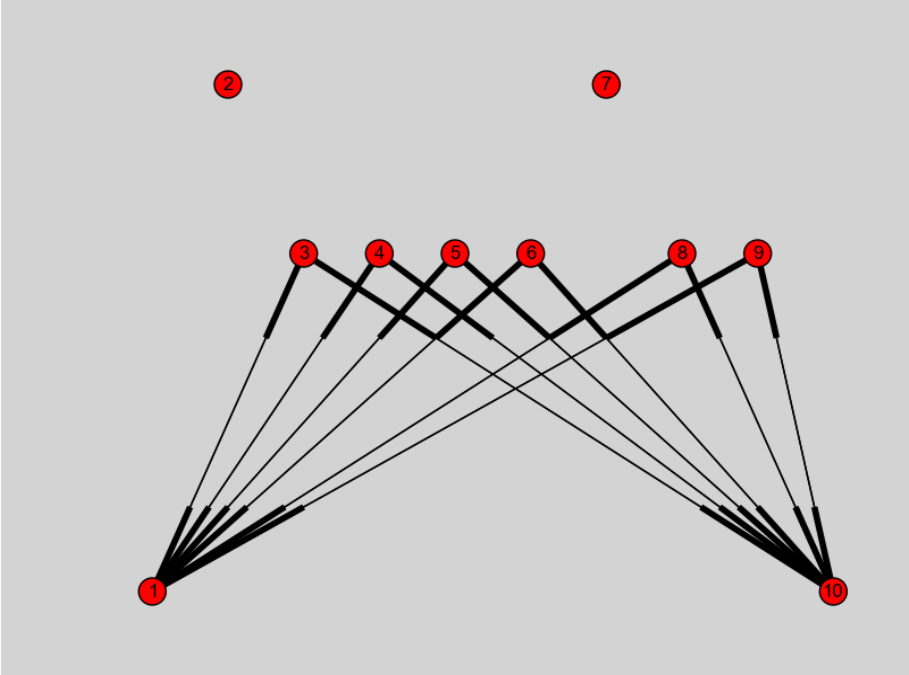
Reflective	False
Anti-reflective	True
Symmetric	False
Asymmetric	False
Anti-symmetric	False
Transitive	True
Anti-Transitive	False
Acyclic	True
Connected	False
Weak Connected	False

Table 6. Analysis of Asymmetric part of relation R

Ratio type : Given Asymmetric part of Ratio R is of type ***Strict order***

0.0	0.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0
1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0
1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0
1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0
1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0
0.0	0.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	0.0

Table 7. Adjacency matrix of non-Comparable relation built on R



Pic 4. Relation of non-comparability built on R

Reflective	False
Anti-reflective	True
Symmetric	True
Asymmetric	False
Anti-symmetric	False
Transitive	False
Anti-Transitive	False
Acyclic	False
Connected	False
Weak Connected	False

Table 8. Relation of non-comparability built on R

Ratio type : Given Non-comparable Ratio built on Ratio R is of type ***Unknown***

Exercise 4. Find sets of optimal solves, using dominating principle(build sets of max on R elements,max on P elements, stricly max on R

Max R on Omega(dominating principle)	[]
Max P on Omega(dominating principle)	[]
Stricly Max R on Omega(dominating principle)	[]

Table 9. Optimal sets(blocking principle)

Exercise 5. Find sets of optimal solves, using blocking principle(build sets of max on R elements,max on P elements, stricly max on R

Max R on Omega(blocking principle)	[8 10]
Max P on Omega(blocking principle)	[]
Stricly Max R on Omega(blocking principle)	[8 10]

Table 10. Optimal sets(dominating principle)

Exercise 6. Find sets of solves optimal by Neiman-Morgenstein; If R or P(R) acyclic, use specific algorithm given for building this sets

Exercise 7. Find sets of 1-,2-,3-,4- max elements

Exercise 8. Make conclusion(decide, which alternativesto choose according to taken results)