

Social and Information Network Analysis

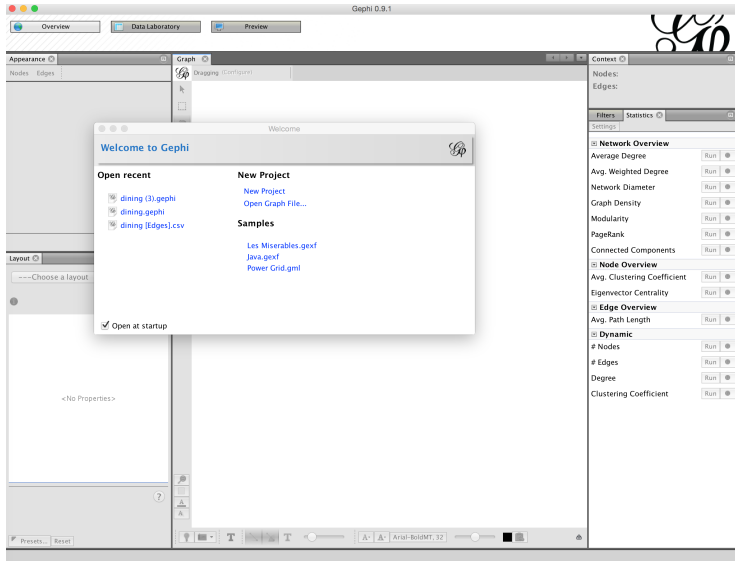
Cornelia Caragea

Department of Computer Science and Engineering
University of North Texas

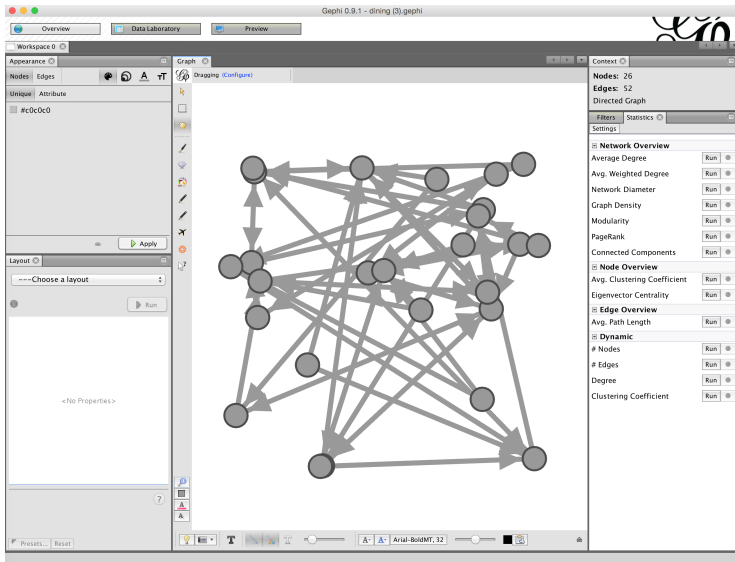
Acknowledgement: Lada Adamic

June 15, 2016

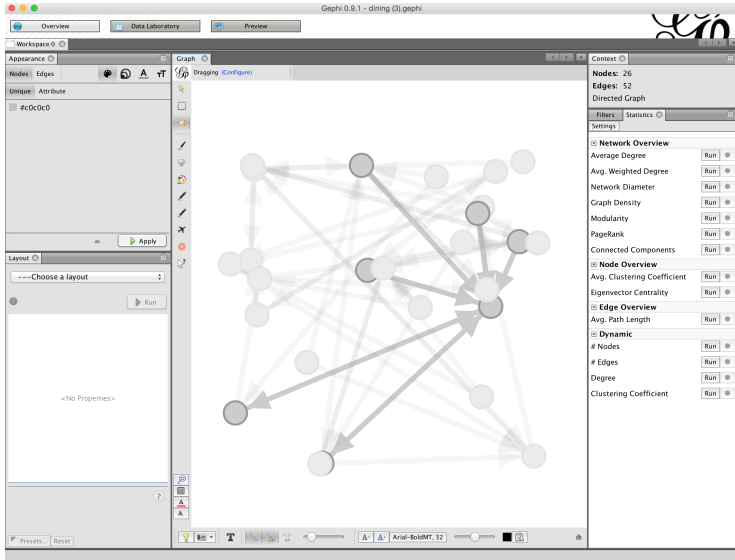
Gephi - Open Graph File...



Gephi



Gephi



Gephi

Gephi 0.9.1 - dining (3).gephi

Overview Data Laboratory Preview

Workspace 0

Appearance Nodes Edges

Unique Attribute

#c0c0c0

Layout

ForceAtlas 2

- Choose a layout
- Contraction
- Expansion
- Force Atlas
- ForceAtlas 2**
- Fruchterman Reingold
- Label Adjust
- Overlap

Approximation 1.2

Tuning

Scaling 10.0

Stronger Gravity ☐

Gravity 1.0

Behavior Alternatives

Dissuade Hubs ☐

LinLog mode ☐

Prevent Overlap ☐

Edge Weight Influence 1.0

ForceAtlas 2

Presets Reset

Graph

Dragging (Configure)

Context

Nodes: 26
Edges: 52
Directed Graph

Filters Statistics

Settings

Network Overview

Average Degree

Avg. Weighted Degree

Network Diameter

Graph Density

Modularity

PageRank

Connected Components

Node Overview

Avg. Clustering Coefficient

Eigenvector Centrality

Edge Overview

Avg. Path Length

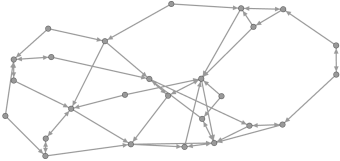
Dynamic

Nodes

Edges

Degree

Clustering Coefficient



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Overview Data Laboratory Preview

Workspace 0

Appearance Nodes Edges

Unique Attribute

Size: 5

Layout ForceAtlas 2

Run

Threads

Threads number 7

Performance

Tolerance (speed) 1.0

Approximate Repulsion

Approximation 1.2

Tuning

Scaling 10.0

Stronger Gravity

Gravity 1.0

Behavior Alternatives

Dissuade Hubs

LinLog mode

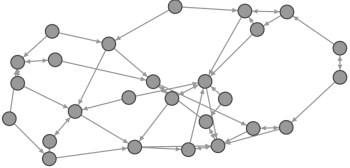
Prevent Overlap

Edge Weight Influence 1.0

ForceAtlas 2

Presets Reset

Graph Dragging (Configure)



Context

Nodes: 26
Edges: 52
Directed Graph

Filters Statistics

Settings

Network Overview

Average Degree Run

Avg. Weighted Degree Run

Network Diameter Run

Graph Density Run

Modularity Run

PageRank Run

Connected Components Run

Node Overview

Avg. Clustering Coefficient Run

Eigenvector Centrality Run

Edge Overview

Avg. Path Length Run

Dynamic

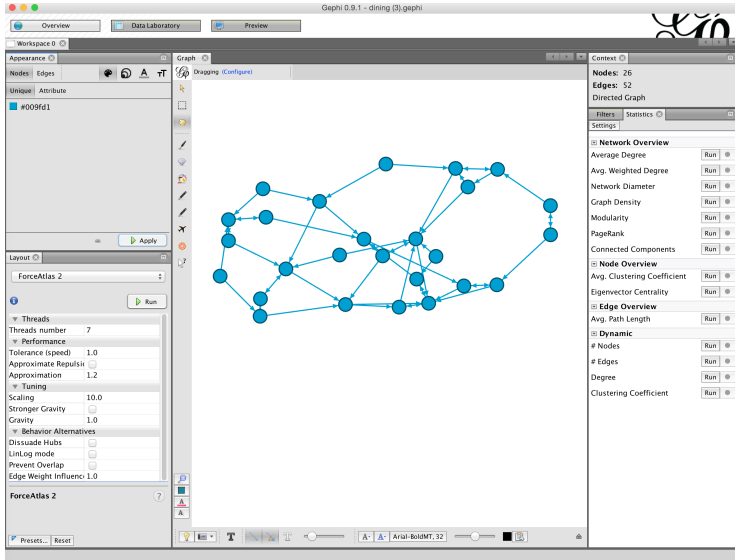
Nodes Run

Edges Run

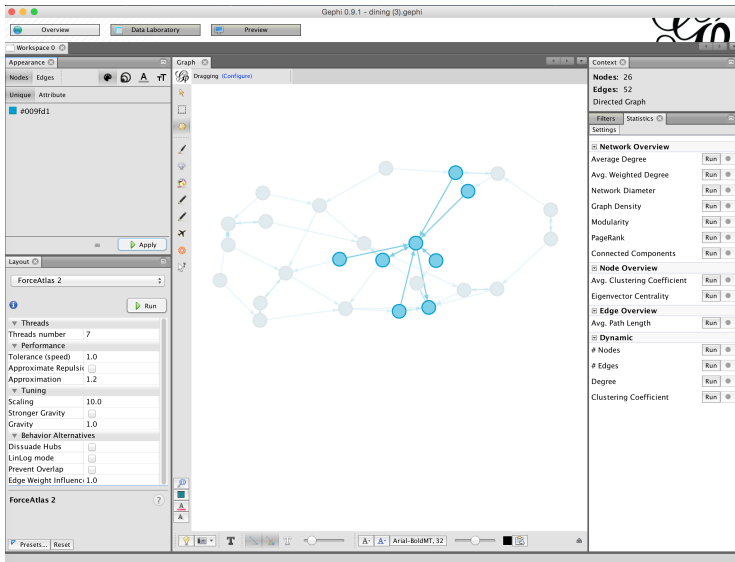
Degree Run

Clustering Coefficient Run

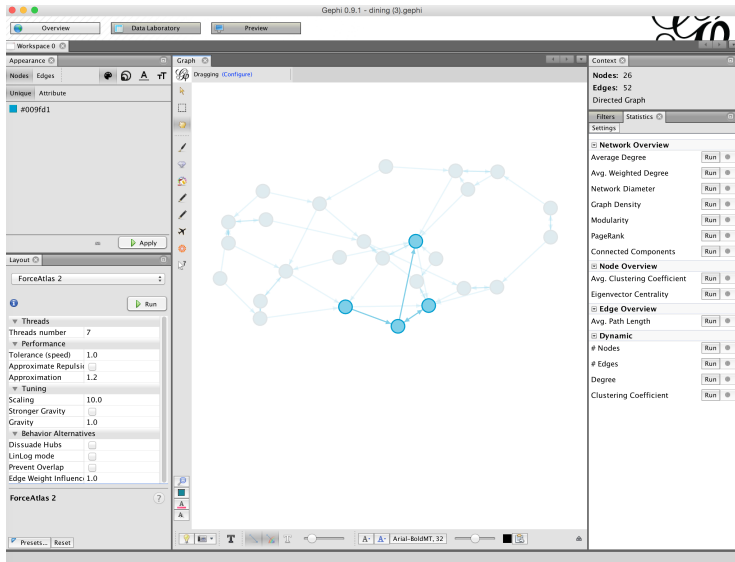
Gephi



Gephi



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Gephi

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Overview Data Laboratory Preview

Workspace 0

Appearance Nodes Edges

Unique Attribute

#009fd1

Apply

Layout ForceAtlas 2

Run

Threads

Threads number 7

Performance

Tolerance (speed) 1.0

Approximate Repulsion ☐

Approximation 1.2

Tuning

Scaling 10.0

Stronger Gravity ☐

Gravity 1.0

Behavior Alternatives

Dissuade Hubs ☐

LinLog mode ☐

Prevent Overlap ☐

Edge Weight Influence 1.0

ForceAtlas 2

Presets Reset

Graph Dragging (Configure)

Context

Nodes: 26

Edges: 52

Directed Graph

Filters Statistics

Settings

Network Overview

Average Degree Run

Avg. Weighted Degree Run

Network Diameter Run

Graph Density Run

Modularity Run

PageRank Run

Connected Components Run

Node Overview

Avg. Clustering Coefficient Run

Eigenvector Centrality Run

Edge Overview

Avg. Path Length Run

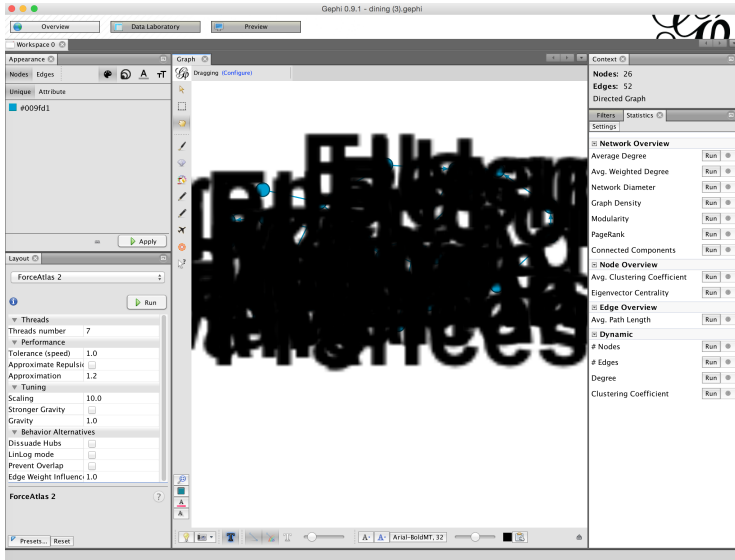
Dynamic

Nodes Run

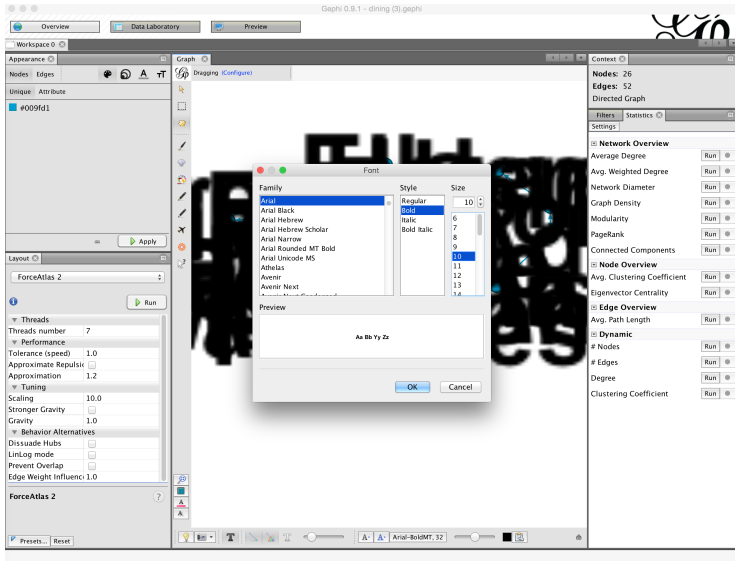
Edges Run

Degree Run

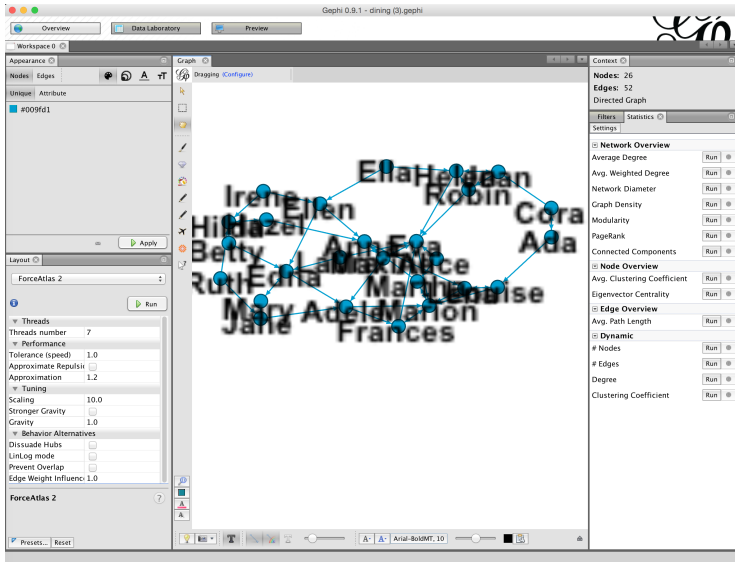
Clustering Coefficient Run



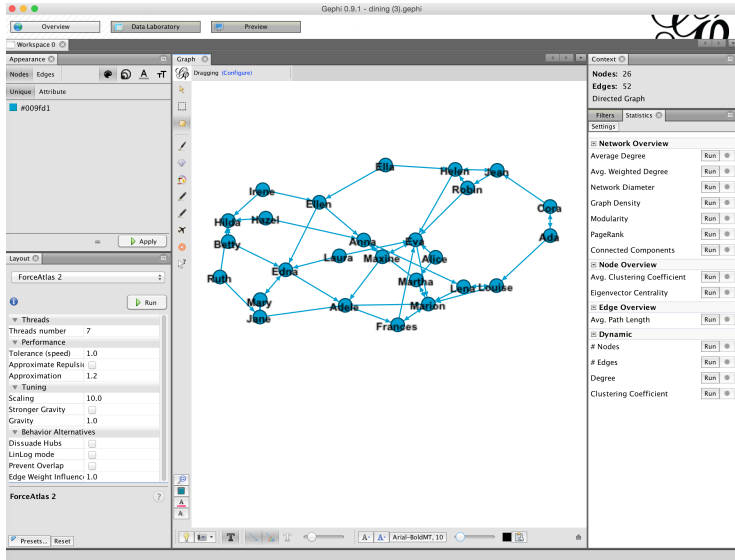
Gephi



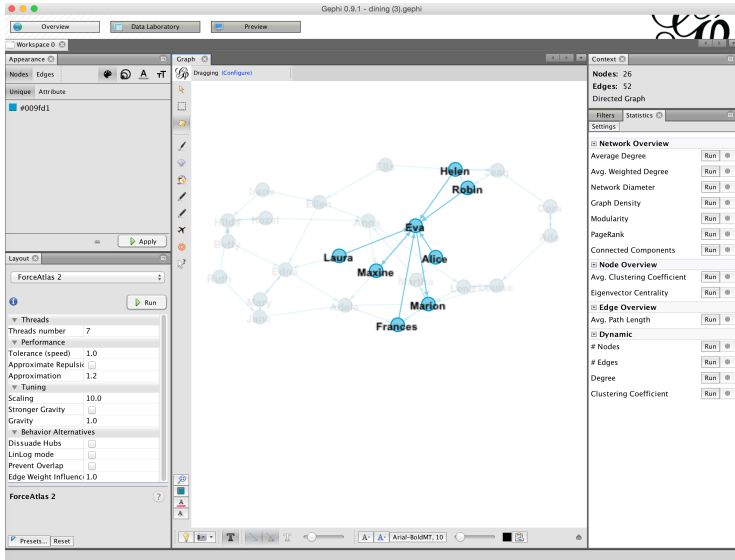
Gephi



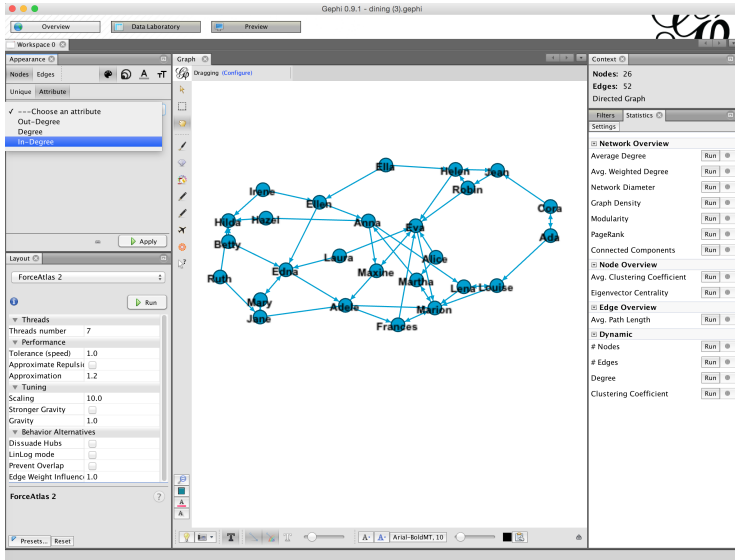
Gephi



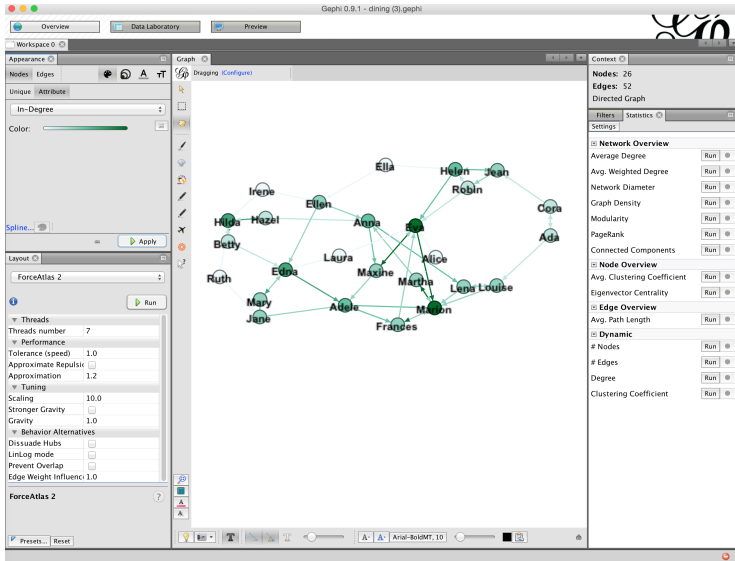
Gephi



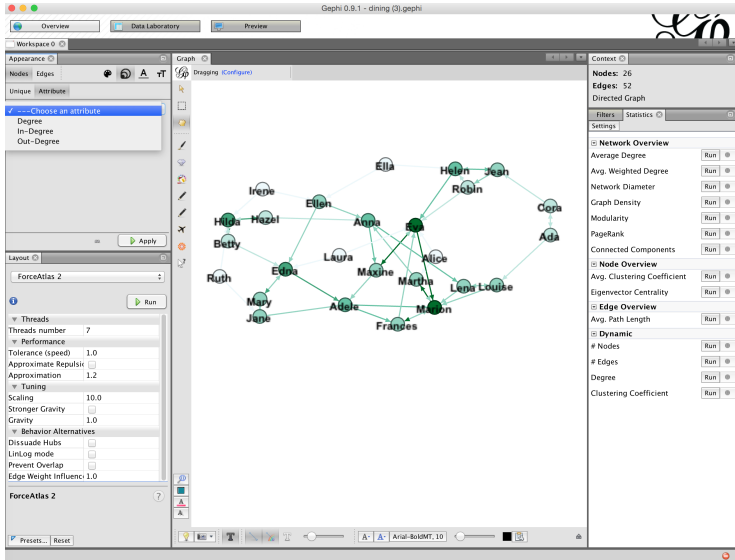
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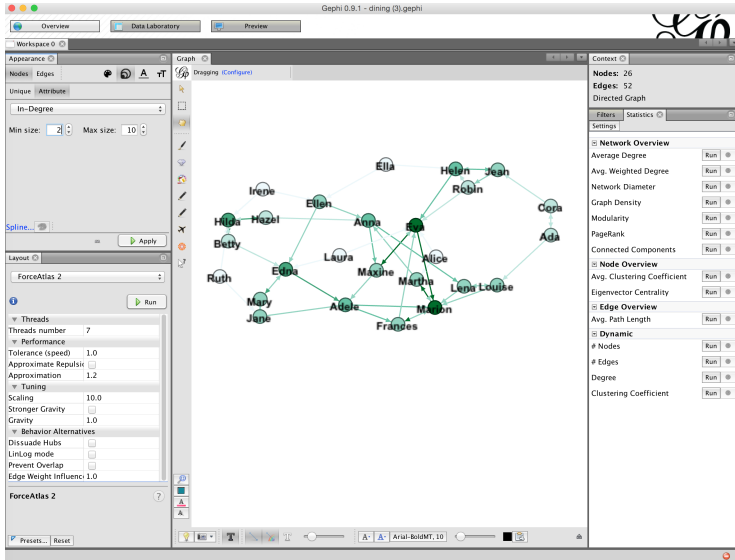
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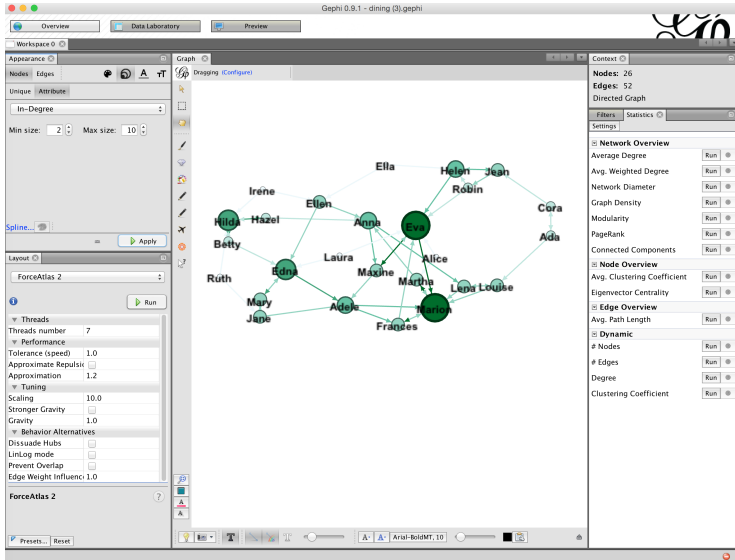
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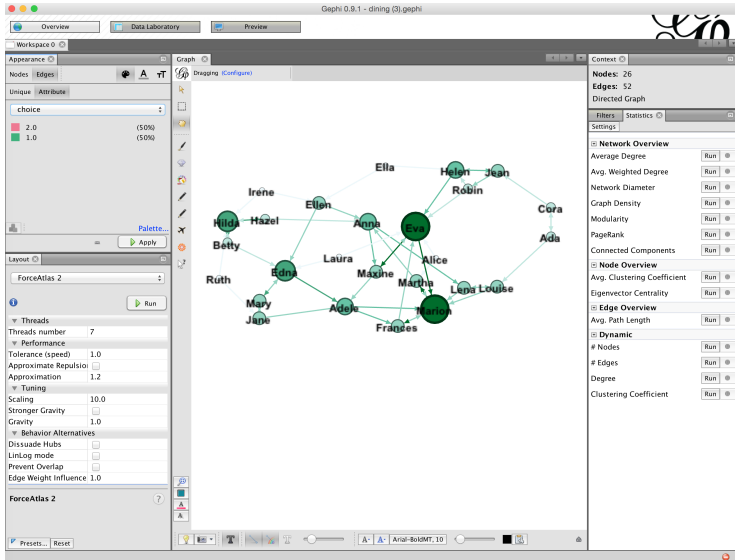
Gephi



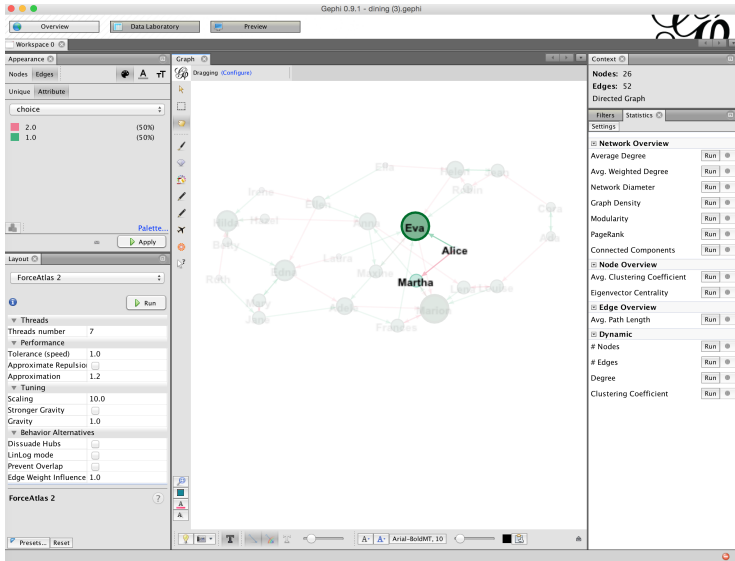
Gephi



Gephi



Gephi



Gephi

Gephi 0.9.1 - dining (3).gephi

Overview Data Laboratory Preview

Workspace 0

Data Table

Nodes Edges Configuration Add node Add edge Search/Replace Import Spreadsheet Export table More actions Filter: Source

Source	Target	Type	Id	Label	Interval	Weight
1	2	Directed	2			1.0
1	3	Directed	1			1.0
2	1	Directed	3			1.0
2	4	Directed	4			1.0
3	9	Directed	5			1.0
3	11	Directed	6			1.0
4	5	Directed	7			1.0
4	8	Directed	8			1.0
5	4	Directed	9			1.0
5	15	Directed	10			1.0
6	9	Directed	11			1.0
6	20	Directed	12			1.0
7	6	Directed	14			1.0
7	15	Directed	13			1.0
8	5	Directed	16			1.0
8	15	Directed	15			1.0
9	6	Directed	17			1.0
9	14	Directed	18			1.0
10	15	Directed	20			1.0
10	18	Directed	19			1.0
11	3	Directed	22			1.0
11	9	Directed	21			1.0
12	13	Directed	23			1.0
12	20	Directed	24			1.0
13	12	Directed	26			1.0
13	22	Directed	25			1.0
14	9	Directed	28			1.0
14	15	Directed	27			1.0
15	9	Directed	30			1.0
15	10	Directed	29			1.0
16	13	Directed	32			1.0
16	19	Directed	31			1.0
17	18	Directed	34			1.0
17	21	Directed	33			1.0
18	9	Directed	36			1.0
18	14	Directed	35			1.0
19	18	Directed	37			1.0
19	21	Directed	38			1.0
20	10	Directed	39			1.0
20	11	Directed	40			1.0

Add column Merge columns Delete column Clear column Copy data to other column Fill column with a value Duplicate column Create a boolean column from regex match Create column with list of regex matching groups Negate boolean values

Gephi

Gephi 0.9.1 - dining (3).gephi

Overview Data Laboratory Preview

Workspace 0

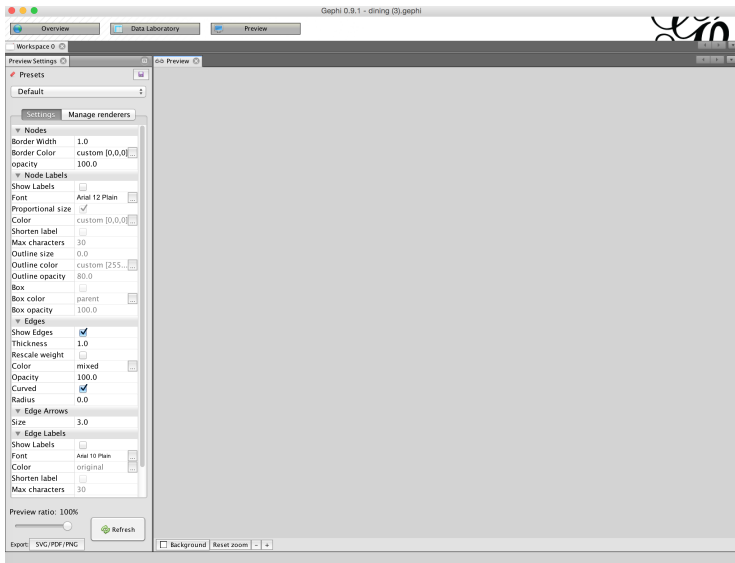
Data Table

Nodes Edges Configuration Add node Add edge Search/Replace Import Spreadsheet Export table More actions Filter: Id

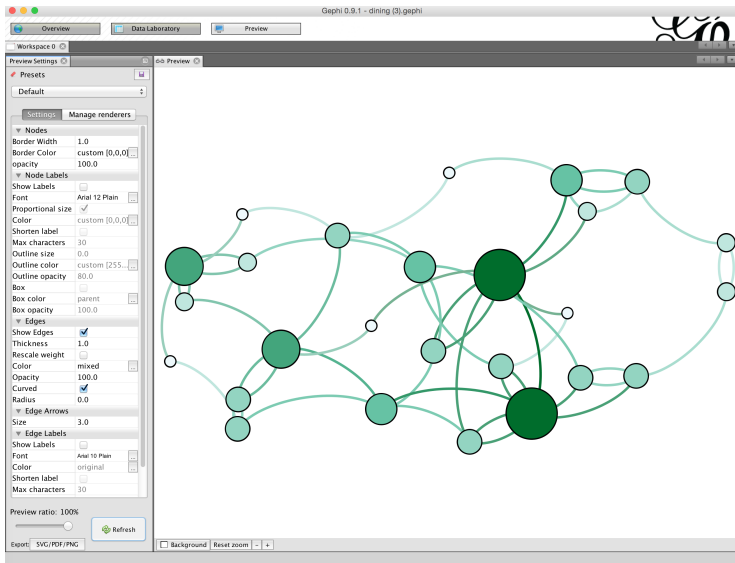
Id	Label
1	Ada
2	Cora
3	Louise
4	Jean
5	Helen
6	Martha
7	Alice
8	Robin
9	Marion
10	Maxine
11	Lena
12	Hazel
13	Hilda
14	Frances
15	Eva
16	Ruth
17	Edna
18	Adele
19	Jane
20	Anna
21	Mary
22	Betty
23	Ella
24	Ellen
25	Laura
26	Irene

Add column Merge columns Delete column Clear column Copy data to other column Fill column with a value Duplicate column Create a boolean column from regex match Create column with list of regex matching groups Negate boolean values

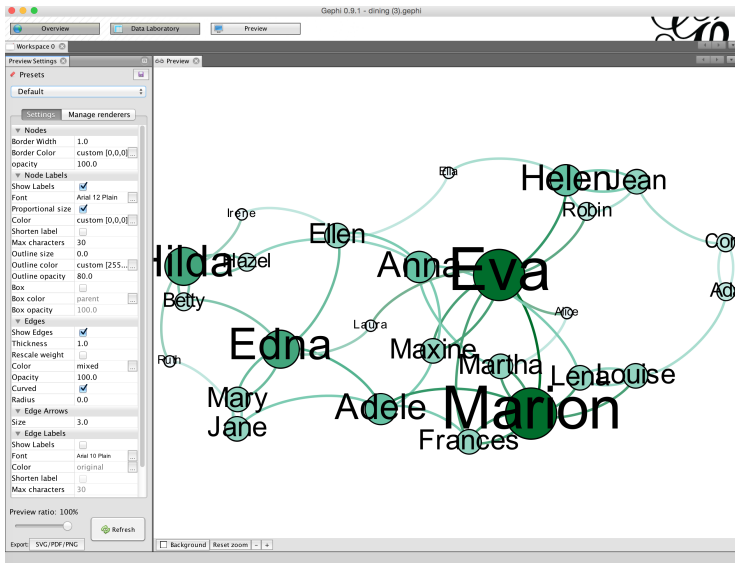
Gephi



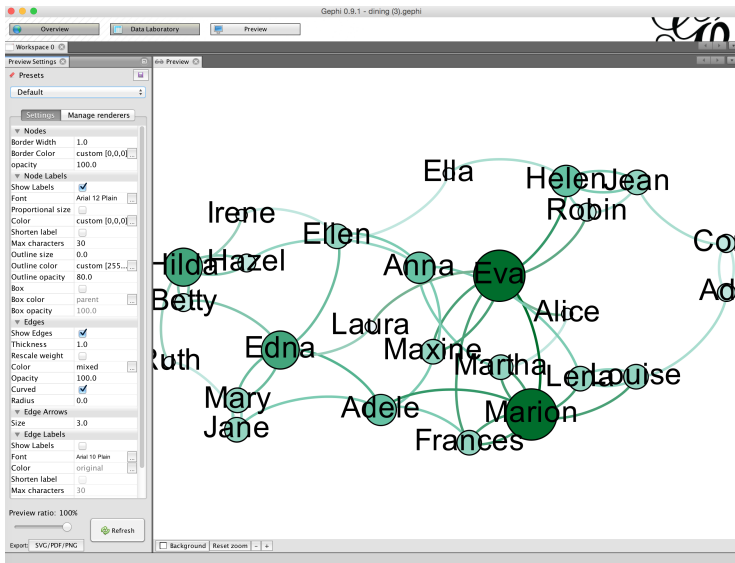
Gephi



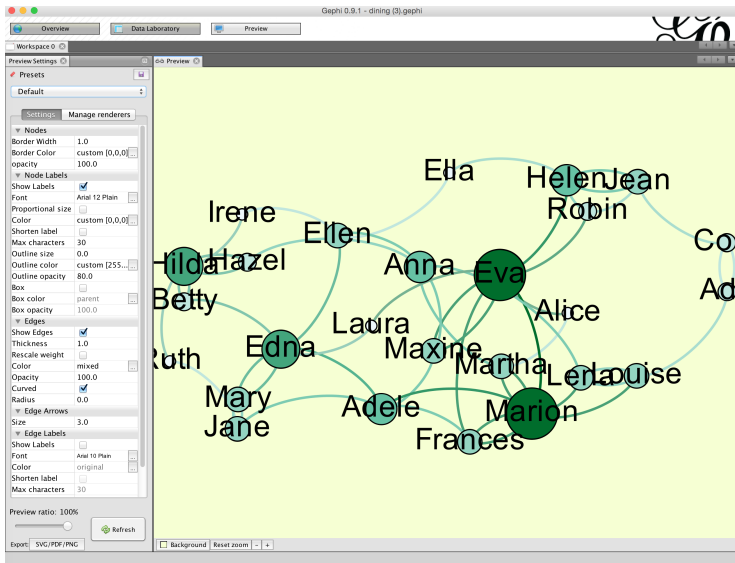
Gephi



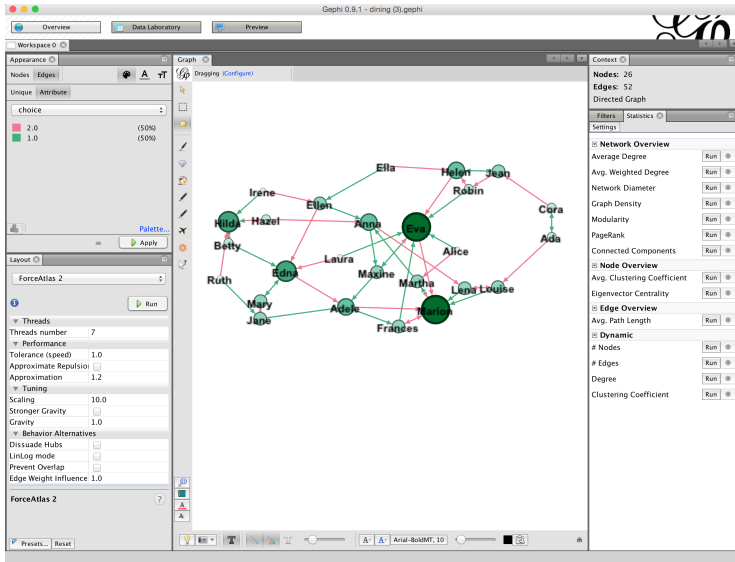
Gephi



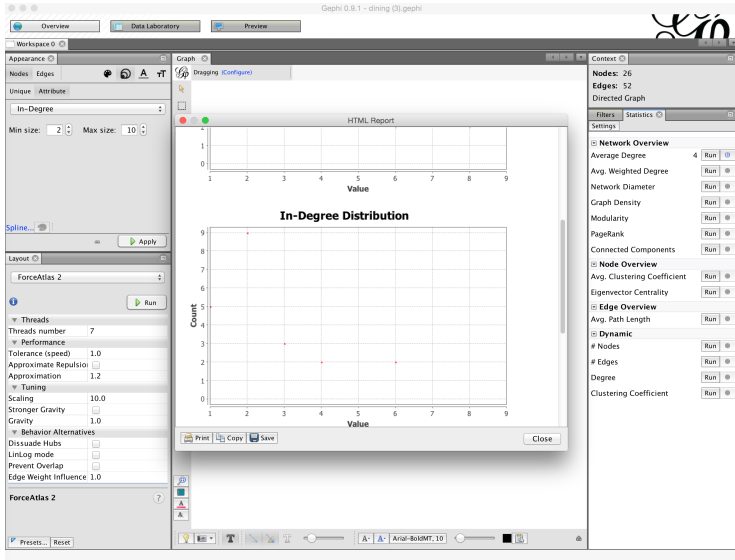
Gephi



Gephi



Gephi



Gephi

The screenshot displays the Gephi 0.9.1 software interface. The main window shows a network graph with nodes labeled Ella, Helen, Jean, Cora, and Ada. A dialog box titled "Connected Components settings" is open in the center. The dialog box contains the following text: "Connected Components Determines the number of connected components in the network." Below this text are two radio button options: "Directed" (selected) and "Undirected". The "Directed" option is accompanied by the text "Detects strongly & weakly connected components", and the "Undirected" option is accompanied by the text "Detects only weakly connected components". At the bottom of the dialog box are "Cancel" and "OK" buttons. The background interface includes a left sidebar with tabs for "Appearance", "Data Laboratory", and "Preview". The "Appearance" tab is active, showing settings for "Nodes" and "Edges", including "In-Degree" and "Min size: 2" / "Max size: 10". The right sidebar shows the "Context" tab with "Nodes: 26" and "Edges: 52". Below this are tabs for "Filters" and "Statistics", with the "Statistics" tab active, showing various network metrics like "Average Degree", "Avg. Weighted Degree", "Network Diameter", etc., each with a "Run" button.

Gephi 0.9.1 - diring (3).gephi

Overview | Data Laboratory | Preview

Workspace 0

Appearance | Graph | Context

Nodes | Edges | Dragging (Configure)

Unique | Attribute

In-Degree

Min size: 2 | Max size: 10

Spline...

Apply

Layout

ForceAtlas 2

Run

Threads

Threads number: 7

Performance

Tolerance (speed): 1.0

Approximate Repulsion: [checkbox]

Approximation: 1.2

Tuning

Scaling: 10.0

Stronger Gravity: [checkbox]

Gravity: 1.0

Behavior Alternatives

Dissuade Hubs: [checkbox]

LinLog mode: [checkbox]

Prevent Overlap: [checkbox]

Edge Weight Influence: 1.0

ForceAtlas 2

Presets... | Reset

Connected Components settings

Connected Components

Determines the number of connected components in the network.

☒ Directed | Detects strongly & weakly connected components

☐ Undirected | Detects only weakly connected components

Cancel | OK

Context

Nodes: 26

Edges: 52

Directed Graph

Filters | Statistics

Settings

Network Overview

Average Degree: 4 | Run

Avg. Weighted Degree: Run

Network Diameter: Run

Graph Density: Run

Modularity: Run

PageRank: Run

Connected Components: Run

Node Overview

Avg. Clustering Coefficient: Run

Eigenvector Centrality: Run

Edge Overview

Avg. Path Length: Run

Dynamic

Nodes: Run

Edges: Run

Degree: Run

Clustering Coefficient: Run



Gephi

Gephi 0.9.1 - dining (3).gephi

Overview Data Laboratory Preview

Workspace 0

Data Table

Nodes Edges Configuration Add node Add edge Search/Replace Import Spreadsheet Export table More actions Filter: Id

Id	Label	In-Degree	Out-Degree	Degree	Component ID	Strongly-Connected ID
1	Ada	1	2	3	0	2
2	Cora	1	2	3	0	2
3	Louise	2	2	4	0	0
4	Jean	2	2	4	0	1
5	Helen	3	2	5	0	1
6	Martha	2	2	4	0	0
7	Alice	0	2	2	0	3
8	Robin	1	2	3	0	1
9	Marion	6	2	8	0	0
10	Maxine	2	2	4	0	0
11	Lena	2	2	4	0	0
12	Hazel	1	2	3	0	5
13	Hilda	4	2	6	0	5
14	Frances	2	2	4	0	0
15	Eva	6	2	8	0	0
16	Ruth	0	2	2	0	6
17	Edna	4	2	6	0	4
18	Adele	3	2	5	0	0
19	Jane	2	2	4	0	4
20	Anna	3	2	5	0	0
21	Mary	2	2	4	0	4
22	Betty	1	2	3	0	5
23	Ella	0	2	2	0	8
24	Ellen	2	2	4	0	7
25	Laura	0	2	2	0	9
26	Irene	0	2	2	0	10

Add column Merge columns Delete column Clear column Copy data to other column Fill column with a value Duplicate column Create a boolean column from regex match Create column with list of regex matching groups Negate boolean values

Gephi

Gephi 0.9.1 - dining (3).gephi

Overview Data Laboratory Preview

Workspace 0

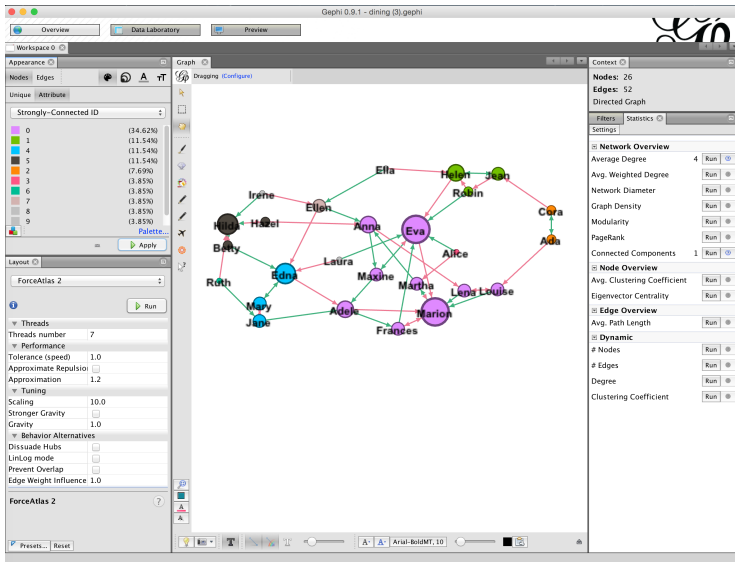
Data Table

Nodes Edges Configuration Add node Add edge Search/Replace Import Spreadsheet Export table More actions Filter: Id

Id	Label	In-Degree	Out-Degree	Degree	Component ID	Strongly-Connected ID
9	Marion	6	2	8	0	0
15	Eva	6	2	8	0	0
13	Hilda	4	2	6	0	5
17	Edna	4	2	6	0	4
5	Helen	3	2	5	0	1
18	Adele	3	2	5	0	0
20	Anna	3	2	5	0	0
3	Louise	2	2	4	0	0
4	Jean	2	2	4	0	1
6	Martha	2	2	4	0	0
10	Maxine	2	2	4	0	0
11	Lena	2	2	4	0	0
14	Frances	2	2	4	0	0
19	Jane	2	2	4	0	4
21	Mary	2	2	4	0	4
24	Ellen	2	2	4	0	7
1	Ada	1	2	3	0	2
2	Cora	1	2	3	0	2
8	Robin	1	2	3	0	1
12	Hazel	1	2	3	0	5
22	Betty	1	2	3	0	5
7	Alice	0	2	2	0	3
16	Ruth	0	2	2	0	6
23	Ella	0	2	2	0	8
25	Laura	0	2	2	0	9
26	Irene	0	2	2	0	10

Add column Merge columns Delete column Clear column Copy data to other column Fill column with a value Duplicate column Create a boolean column from regex match Create column with list of regex matching groups Negate boolean values

Gephi



Gephi

Gephi 0.9.1 - dining (3).gephi

Overview | Data Laboratory | Preview

Workspace 0

Appearance | Graph | Context

Nodes | Edges | Dragging (Configure)

Unique | Attribute

Strongly-Connected ID

Color	Value	Percentage
0	0	(34.62%)
1	1	(11.54%)
4	4	(11.54%)
5	5	(11.54%)
2	2	(7.69%)
3	3	(3.85%)
6	6	(3.85%)
7	7	(3.85%)
8	8	(3.85%)
9	9	(3.85%)

Layout

ForceAtlas 2

Run

Threads

Threads number: 7

Performance

Tolerance (speed): 1.0

Approximate Repulsion: ☐

Approximation: 1.2

Tuning

Scaling: 10.0

Stronger Gravity: ☐

Gravity: 1.0

Behavior Alternatives

Dissuade Hubs: ☐

LinLog mode: ☐

Prevent Overlap: ☐

Edge Weight Influence: 1.0

ForceAtlas 2

Presets... | Reset

Graph

Dragging (Configure)

Context

Nodes: 2 (7.69% visible)

Edges: 1 (1.92% visible)

Directed Graph

Filters | Statistics

Reset | ☐ ☐ ☐ A:

Library

- Attributes
 - Equal
 - Component ID Integer (Node)
 - Degree Integer (Node)
 - In-Degree Integer (Node)
 - Out-Degree Integer (Node)
 - Strongly-Connected ID Integer
 - choice String (Edge)
 - Inter Edges
 - Intra Edges
 - Non-null
 - Partition
 - Partition Count

Queries

- Equal (In-Degree)
 - Parameters
 - columns: In-Degree (class java.l
 - match: 6
 - range: 0 - 6
 - Drag subfilter here

Equal (In-Degree) Settings

Value:

Minimum: 0

Maximum: 6

Stop

Eva

Marion

Arial-BoldMT, 10