Network Visualization in Gephi

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Social Networks

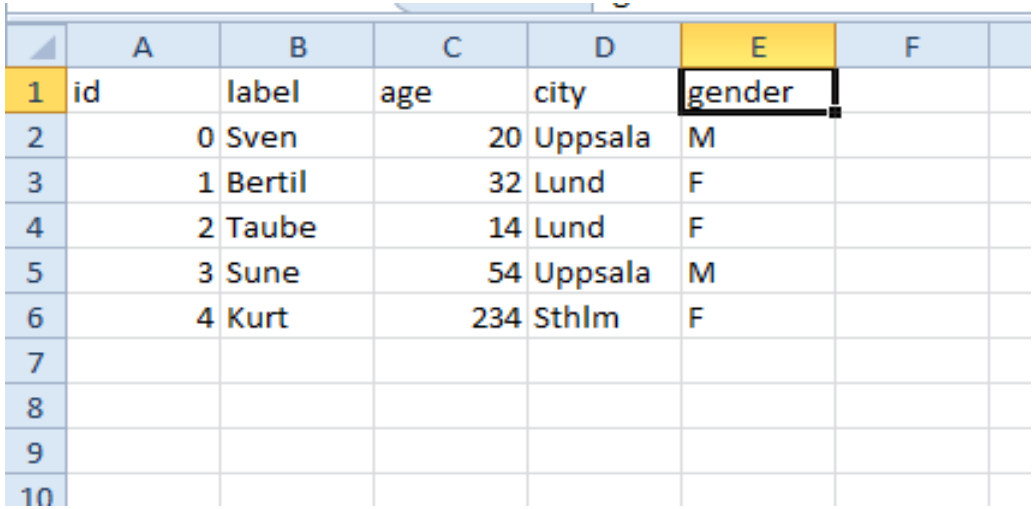
RWTH Aachen – Sommersemester 2019

About this software

- Open source
- Cross-platform compatible
- Good visualization tools
- Reasonable analytical tools
- Plugin-based
- Good introduction

http://en.wikipedia.org/wiki/Social_network_analysis_software

Importing Nodes into Gephi



	A	B	C	D	E	F
1	id	label	age	city	gender	
2	0	Sven	20	Uppsala	M	
3	1	Bertil	32	Lund	F	
4	2	Taube	14	Lund	F	
5	3	Sune	54	Uppsala	M	
6	4	Kurt	234	Sthlm	F	
7						
8						
9						
10						

CSV file containing the **list of nodes**
Header row (column labels)
id: unique number (incremental)
label: name of the node/actor
Additional columns: attributes

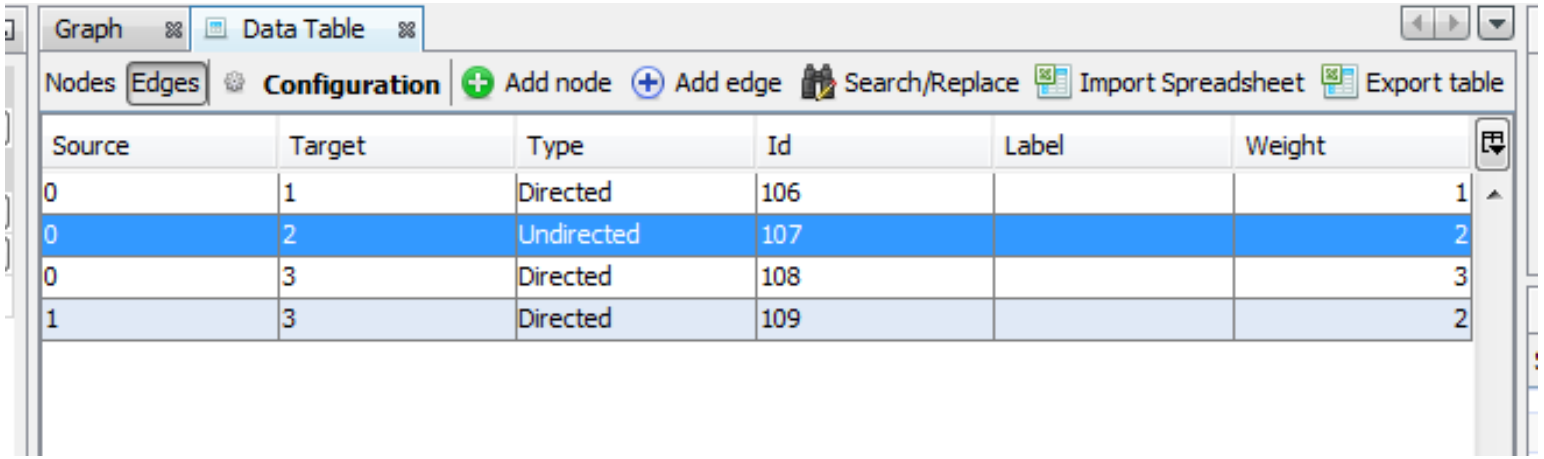
Nodes	Id	Label	age	city	gender
Sven	0	Sven	20	Uppsala	M
Bertil	1	Bertil	32	Lund	F
Taube	2	Taube	14	Lund	F
Sune	3	Sune	54	Uppsala	M
Kurt	4	Kurt	234	Sthlm	F

Post-import editing:
Changing values
Adding new attributes
Adding/deleting nodes

Importing Edges into Gephi

	A	B	C	D
1	Source	Target	Type	weight
2	0	1	Directed	1
3	0	2	undirecte	2
4	0	3	directed	3
5	1	3	directed	2
6				

CSV file containing the **list of edges**
Header row
Source: from-node (id)
Target: to-node (id)
By **default** directional
Additional headers: type, weight



Post-import editing:
Changing values
Adding/deleting edges

Importing Graphs Into Gephi!

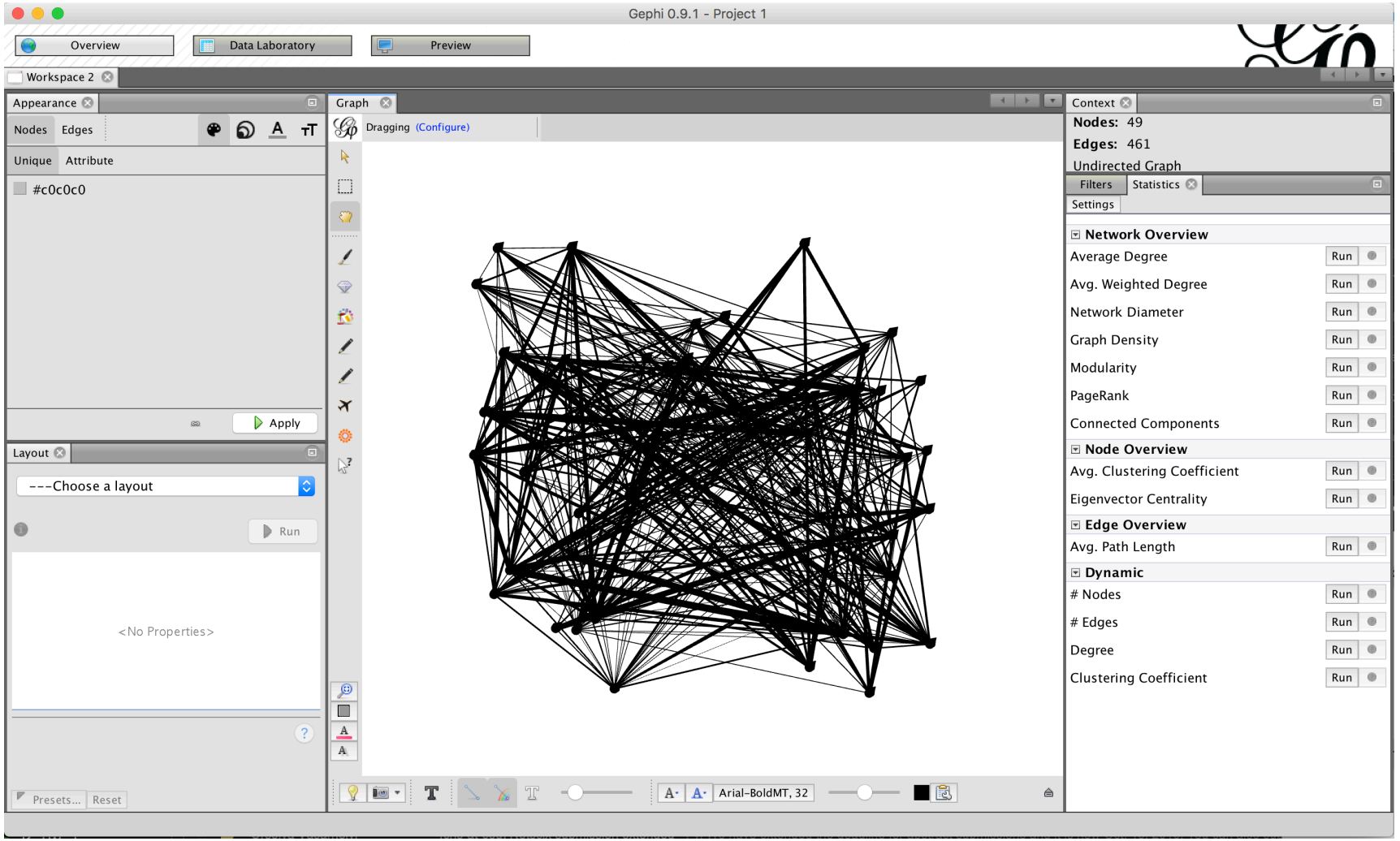
Gephi can import multiple standardized graph formats:

1. Gexf
2. GML
3. GML
4. NET
5. DOT

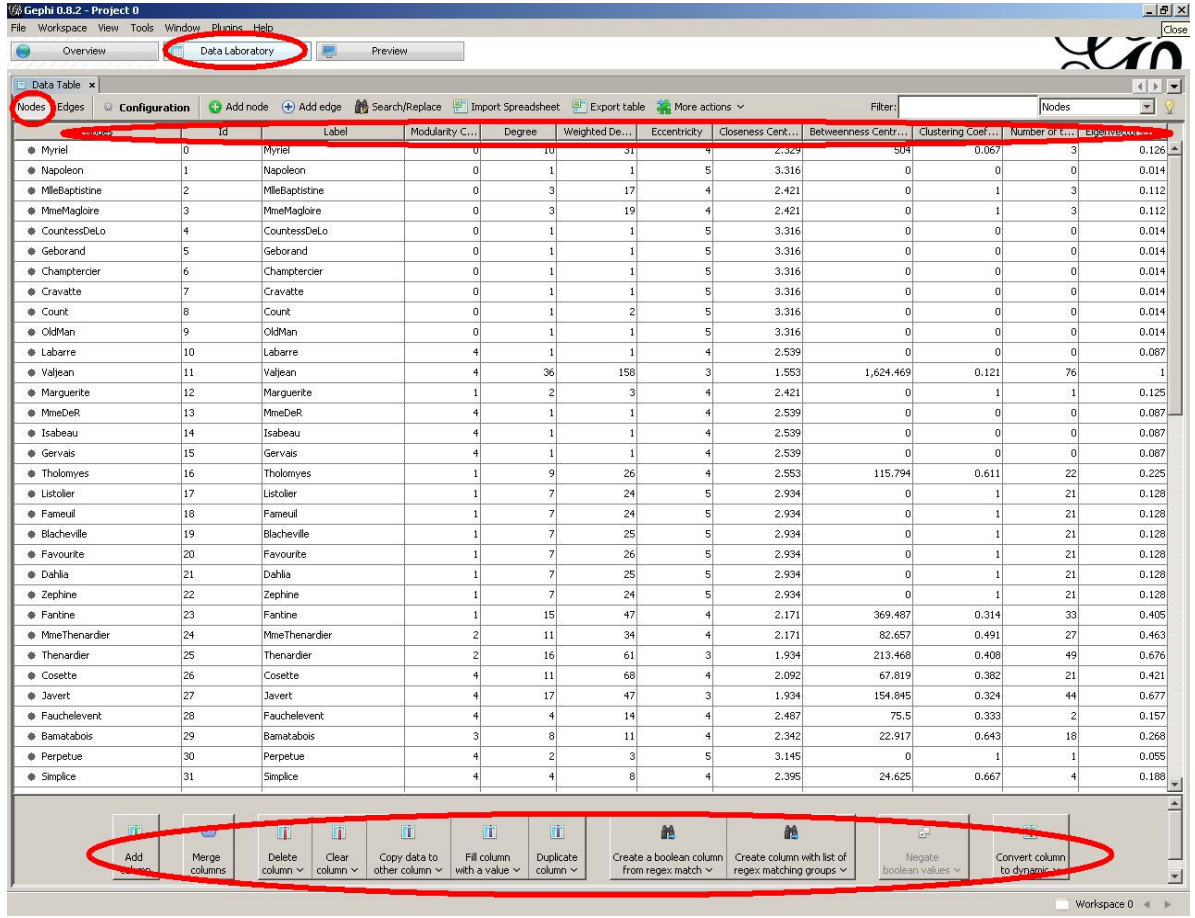
…

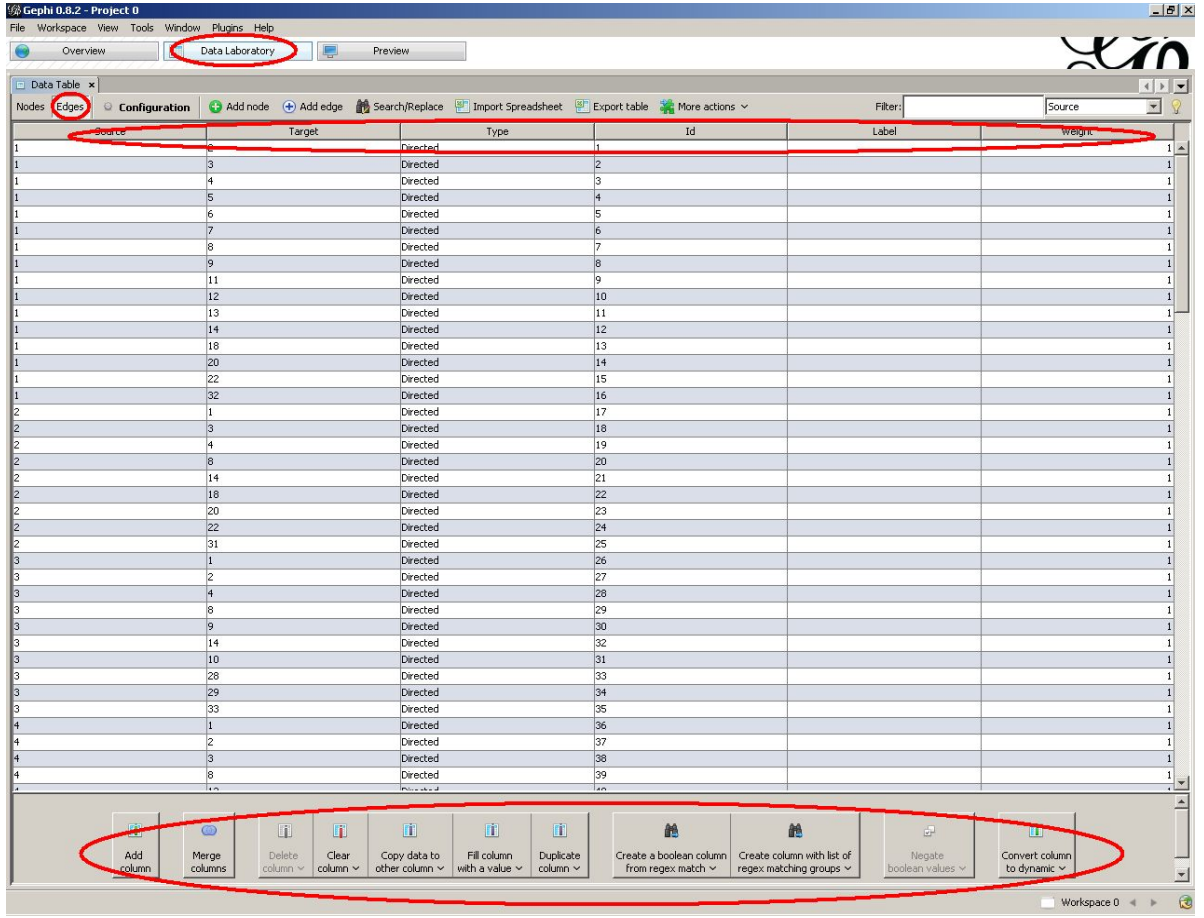
Standard network analysis packages in Python, R, etc. can export these!

Overview Window



Data Laboratory





Export data

File / Export / Graph file…

→ Ucinet: .dl

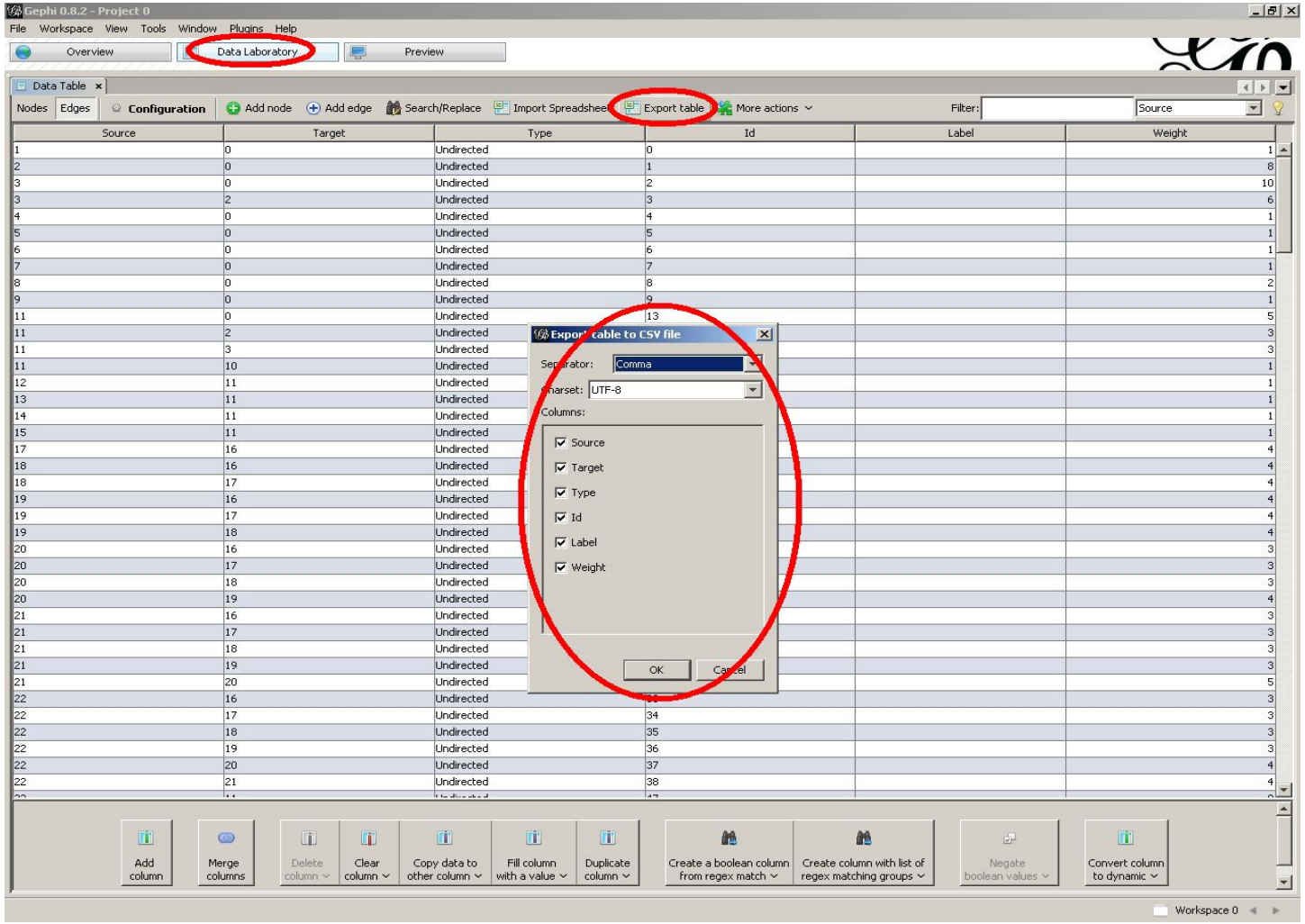
→ Pajek: .net

→ Visone/Gephi: GraphML

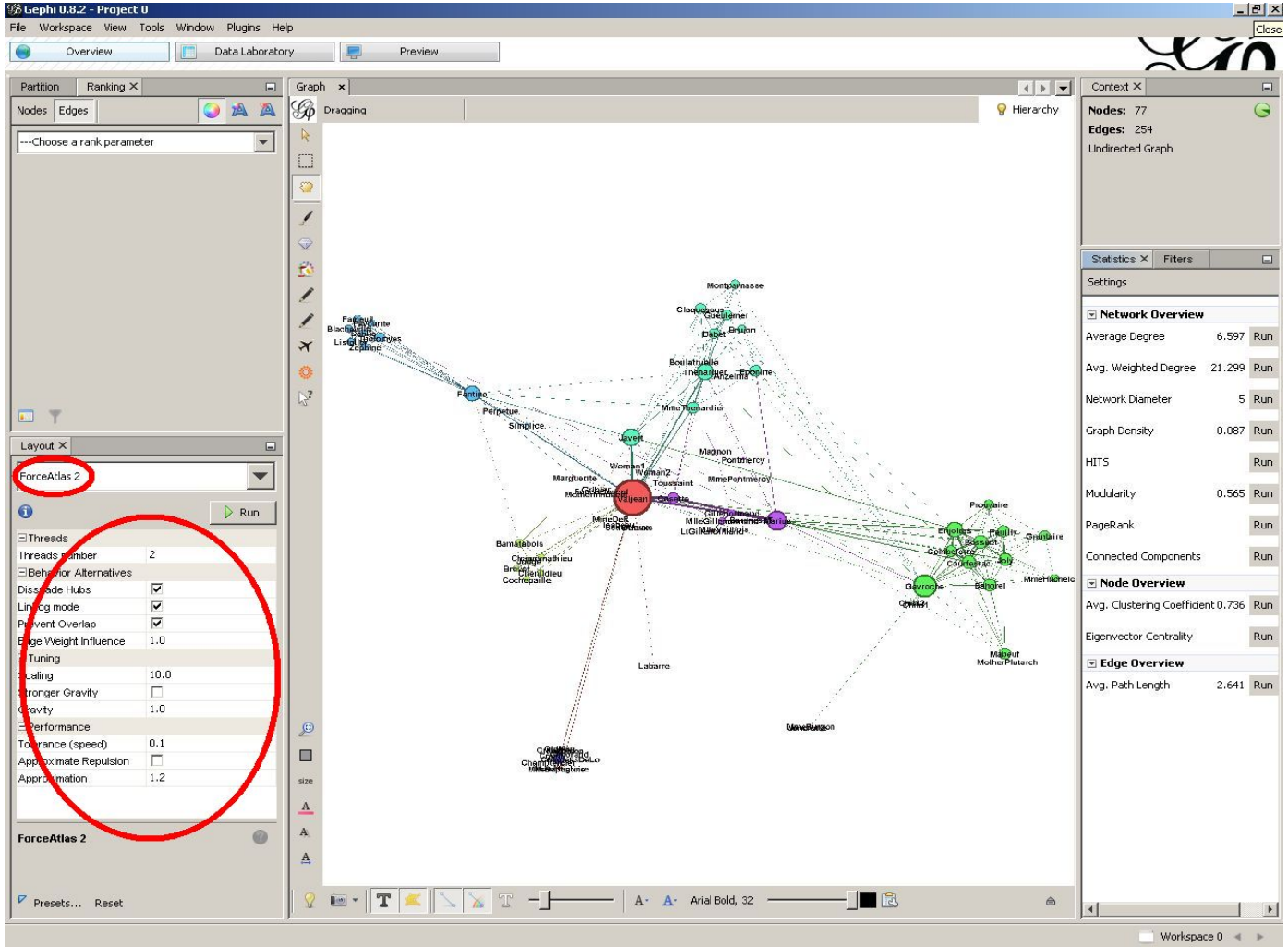
→ CytoScape: GML

Etc.

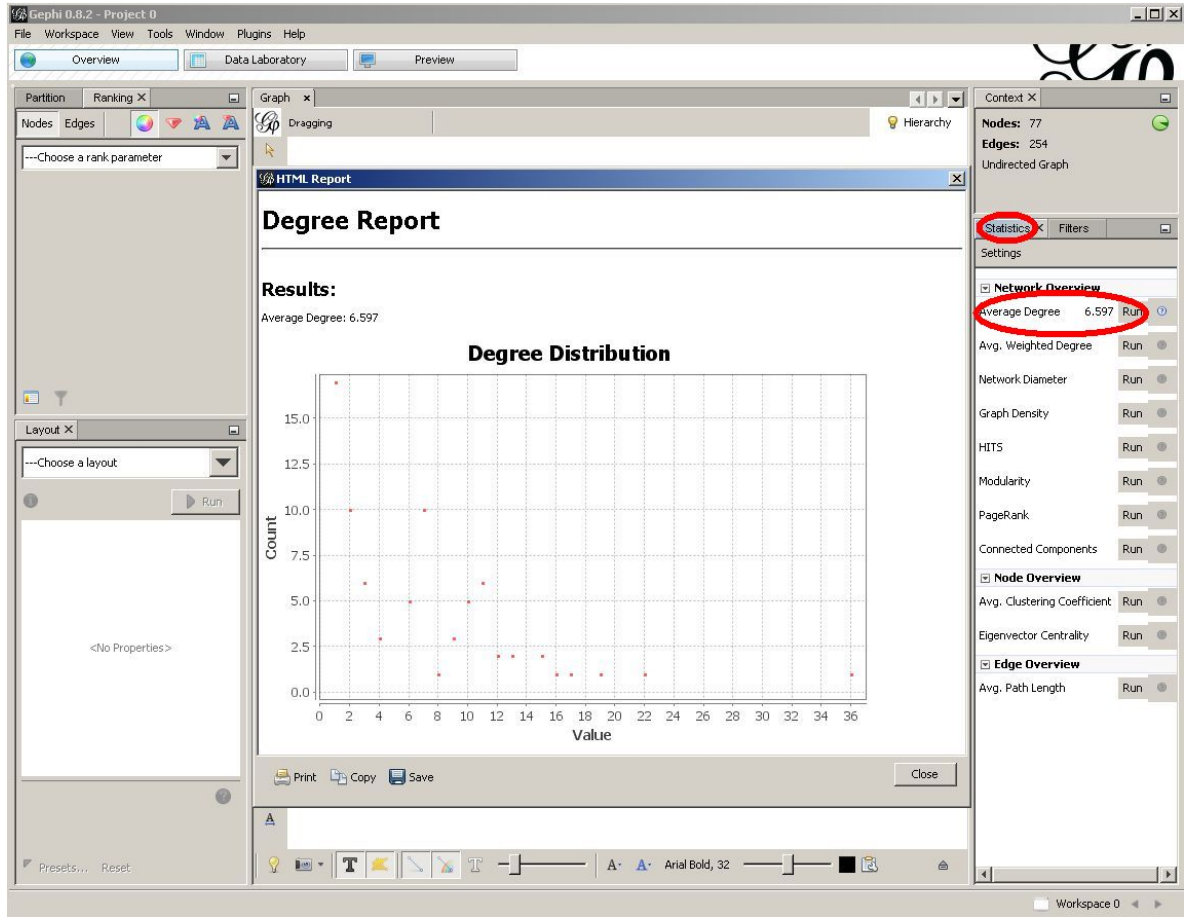
Take it anywhere from here!

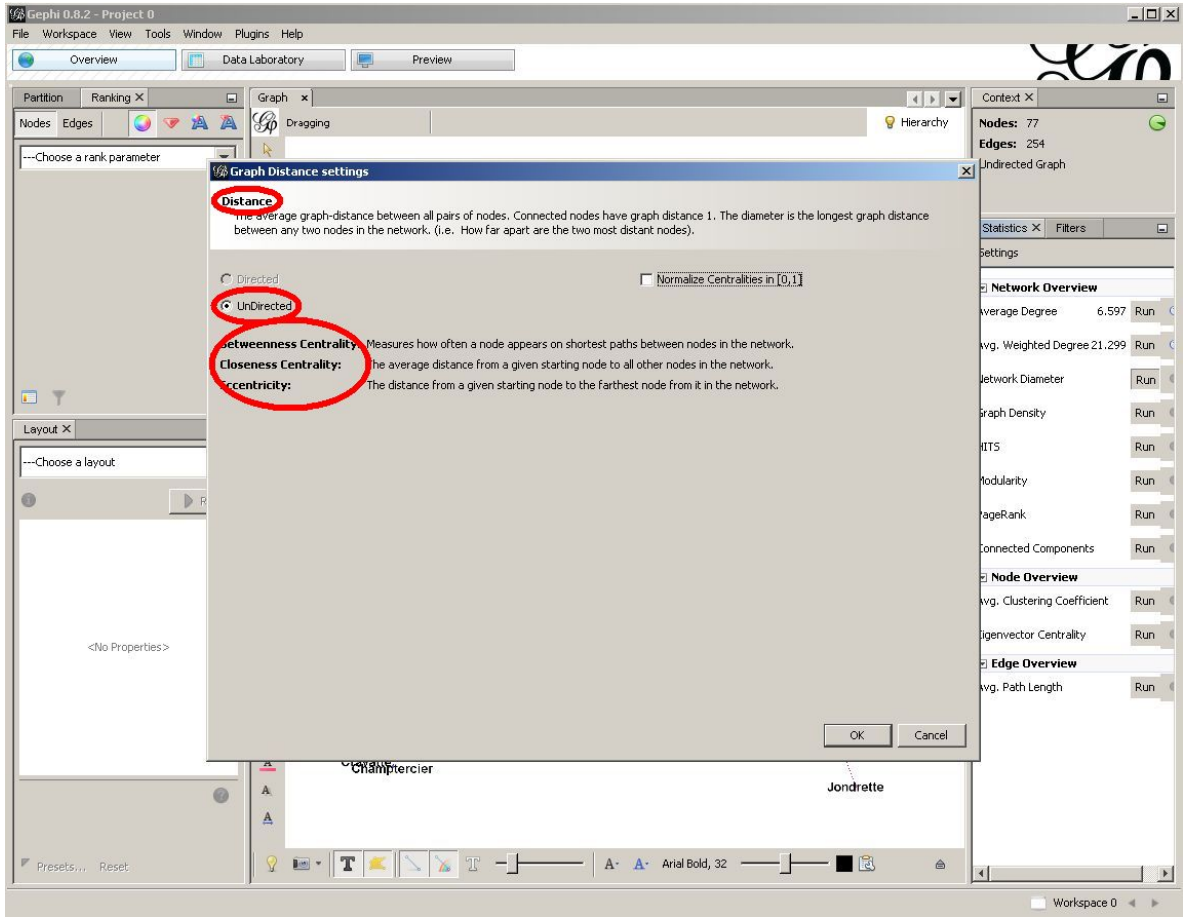


Layouts


Gephi 0.8.2 - Project 0
File Workspace View Tools Window Plugins Help
Overview
Data Laboratory
Preview
Partition
Ranking
Nodes
Edges
---Choose a rank parameter
Layout
ForceAtlas 2
Run
Threads
Threads Number
2
Behavior Alternatives
Dissuade Hubs
LinLog mode
Prevent Overlap
Edge Weight Influence
1.0
Tuning
Scaling
10.0
Stronger Gravity
Gravity
1.0
Performance
Tolerance (speed)
0.1
Approximate Repulsion
Approximation
1.2
ForceAtlas 2
Presets...
Reset
Graph
Dragging
Hierarchy
Arial Bold, 32
Context
Nodes: 77
Edges: 254
Undirected Graph
Statistics
Filters
Settings
Network Overview
Average Degree 6.597 Run
Avg. Weighted Degree 21.299 Run
Network Diameter 5 Run
Graph Density 0.087 Run
HITS Run
Modularity 0.565 Run
PageRank Run
Connected Components Run
Node Overview
Avg. Clustering Coefficient 0.736 Run
Eigenvector Centrality Run
Edge Overview
Avg. Path Length 2.641 Run
Workspace 0

Statistics


Gephi 0.8.2 - Project 0
File Workspace View Tools Window Plugins Help
Overview
Data Laboratory
Preview
Partition
Ranking
Nodes Edges
---Choose a rank parameter
Graph
Dragging
Hierarchy
HTML Report
Degree Report
Results:
Average Degree: 6.597
Degree Distribution
Count
Value
Print
Copy
Save
Close
Context
Nodes: 77
Edges: 254
Undirected Graph
Statistics
Filters
Settings
Network Overview
Average Degree 6.597 Run
Avg. Weighted Degree Run
Network Diameter Run
Graph Density Run
HITS Run
Modularity Run
PageRank Run
Connected Components Run
Node Overview
Avg. Clustering Coefficient Run
Eigenvector Centrality Run
Edge Overview
Avg. Path Length Run
Layout
---Choose a layout
Run
<No Properties>
Presets... Reset
Arial Bold, 32
Workspace 0


Gephi 0.8.2 - Project 0
File Workspace View Tools Window Plugins Help
Overview
Data Laboratory
Preview
Graph Distance settings
Distance
The average graph-distance between all pairs of nodes. Connected nodes have graph distance 1. The diameter is the longest graph distance between any two nodes in the network. (i.e. How far apart are the two most distant nodes).
Directed
UnDirected
Normalize Centralities in [0,1]
Betweenness Centrality: Measures how often a node appears on shortest paths between nodes in the network.
Closeness Centrality: The average distance from a given starting node to all other nodes in the network.
Eccentricity: The distance from a given starting node to the farthest node from it in the network.
OK
Cancel
Champtercier
Jondrette
Context
Nodes: 77
Edges: 254
Undirected Graph
Statistics
Filters
Settings
Network Overview
Average Degree 6.597 Run
Avg. Weighted Degree 21.299 Run
Network Diameter Run
Graph Density Run
HITS Run
Modularity Run
PageRank Run
Connected Components Run
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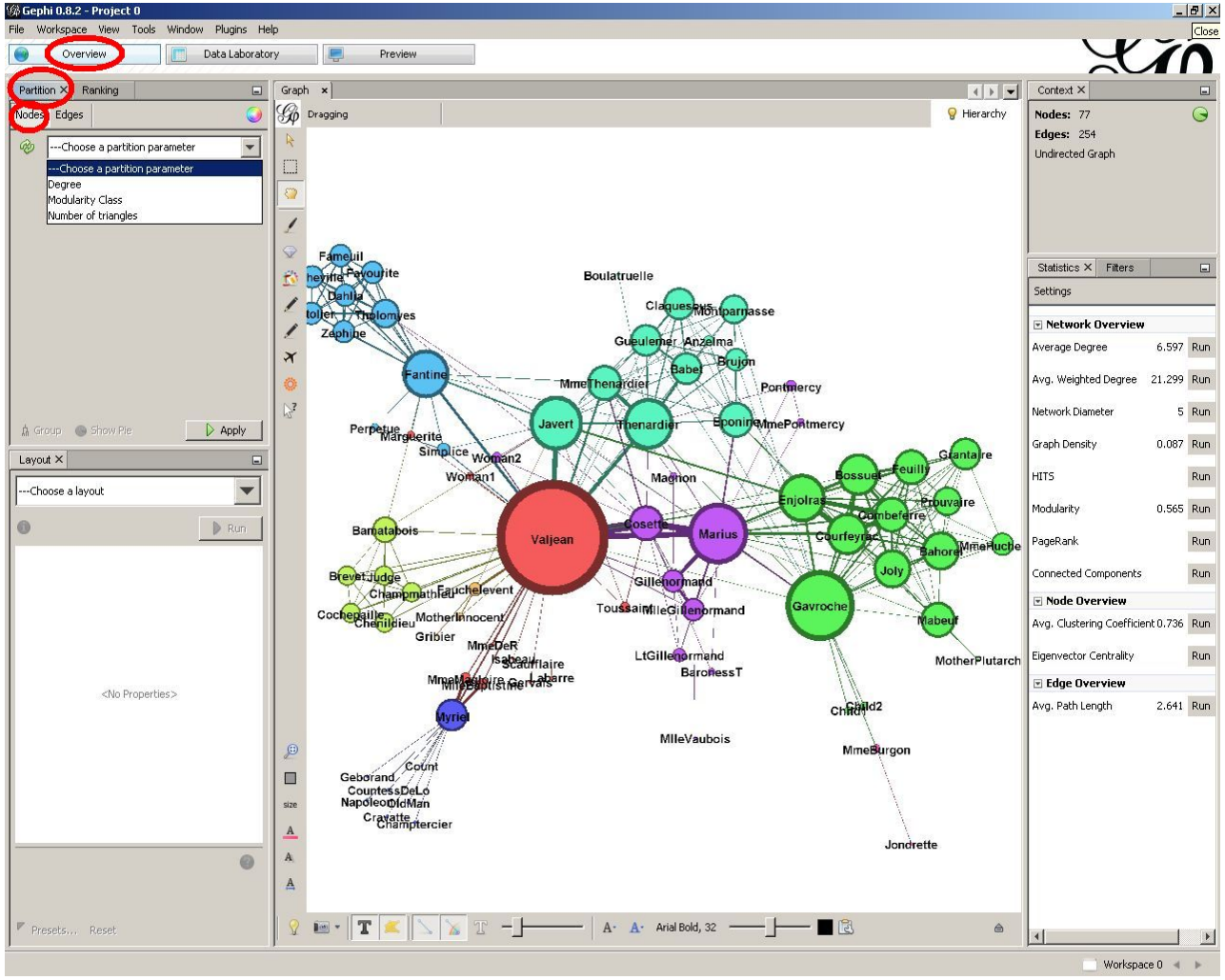
Edge Overview
Avg. Path Length Run
Layout
---Choose a layout
<No Properties>
Presets... Reset
Arial Bold, 32
Workspace 0

Partition


Gephi 0.8.2 - Project 0
File Workspace View Tools Window Plugins Help
Overview
Data Laboratory
Preview
Partition
Ranking
Nodes
Edges
---Choose a partition parameter
---Choose a partition parameter
Degree
Modularity Class
Number of triangles
Group
Show Pie
Apply
Layout
---Choose a layout
Run
<No Properties>
Presets...
Reset
Graph
Dragging
Hierarchy
Valjean
Marius
Cosette
Javert
Thenardier
Fantine
Gavroche
Enjolras
Bossuet
Feuilly
Courfeyrac
Joly
Combeferre
Prouvaire
Grantaire
MmeHuche
Bahorel
Mabeuf
Eponine
MmePontmercy
Pontmercy
MmeThenardier
Babet
Brujon
Gueulemer
Anzelma
Montparnasse
Claquesous
Boulatruelle
Fameuil
Favourite
Dahlia
Zephine
Thalomyes
Perpetue
Margueerite
Simplice
Woman1
Woman2
Magnon
Bamatabois
Brevet
Judge
Champmathieu
Fauchelevent
Cochepaille
Chenildieu
MotherInnocent
Gribier
MmeDeR
Isabeau
Scaufflaire
Labarre
Myriel
Count
Geborand
CountessDeLo
NapoleonDieMan
Cravatte
Champtercier
Gillenormand
Toussaint
MlleGillenormand
LtGillenormand
BaronessT
MlleVaubois
Child2
Child1
MmeBurgon
Jondrette
MotherPlutarch
Arial Bold, 32
Context
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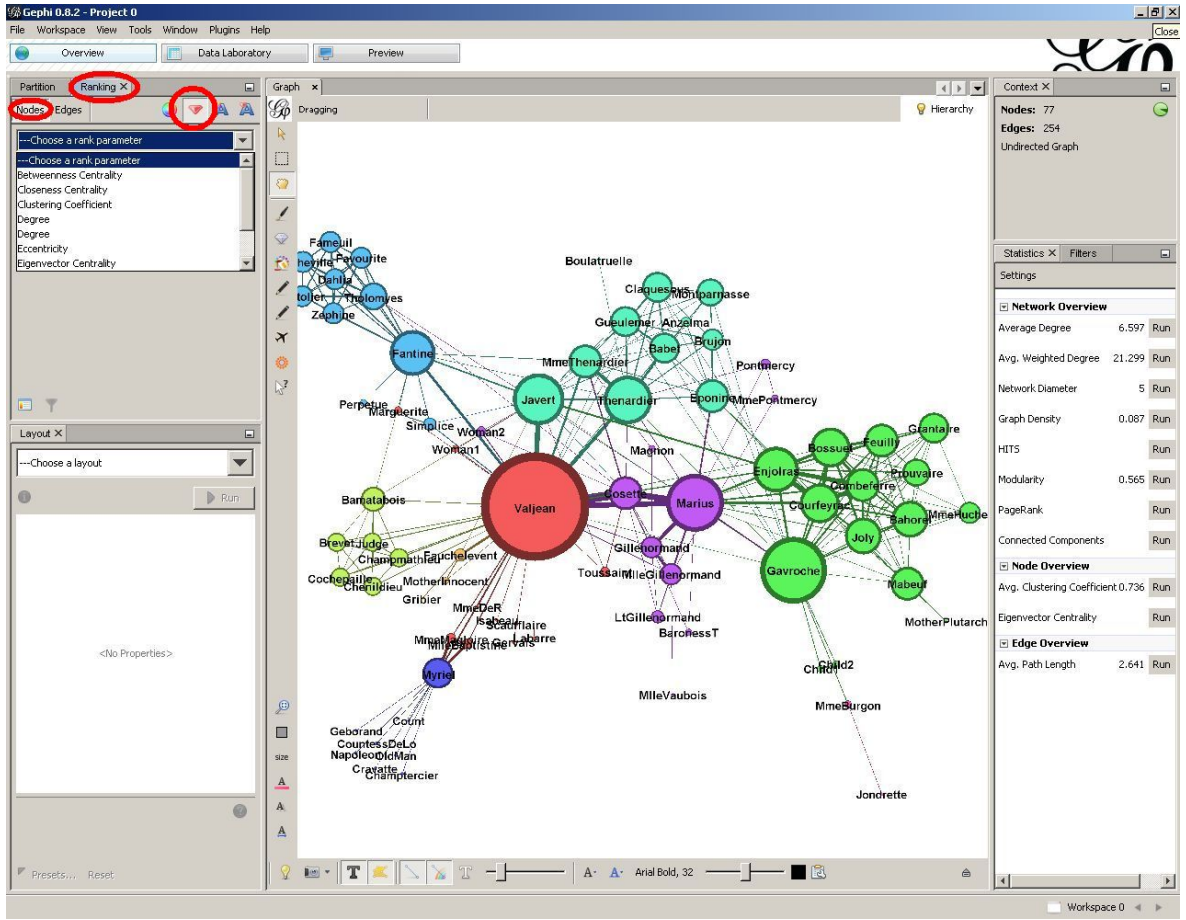
Ranking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Overview
Data Laboratory
Preview
Partition
Ranking
Nodes
Edges
---Choose a rank parameter
Betweenness Centrality
Closeness Centrality
Clustering Coefficient
Degree
Degree
Eccentricity
Eigenvector Centrality
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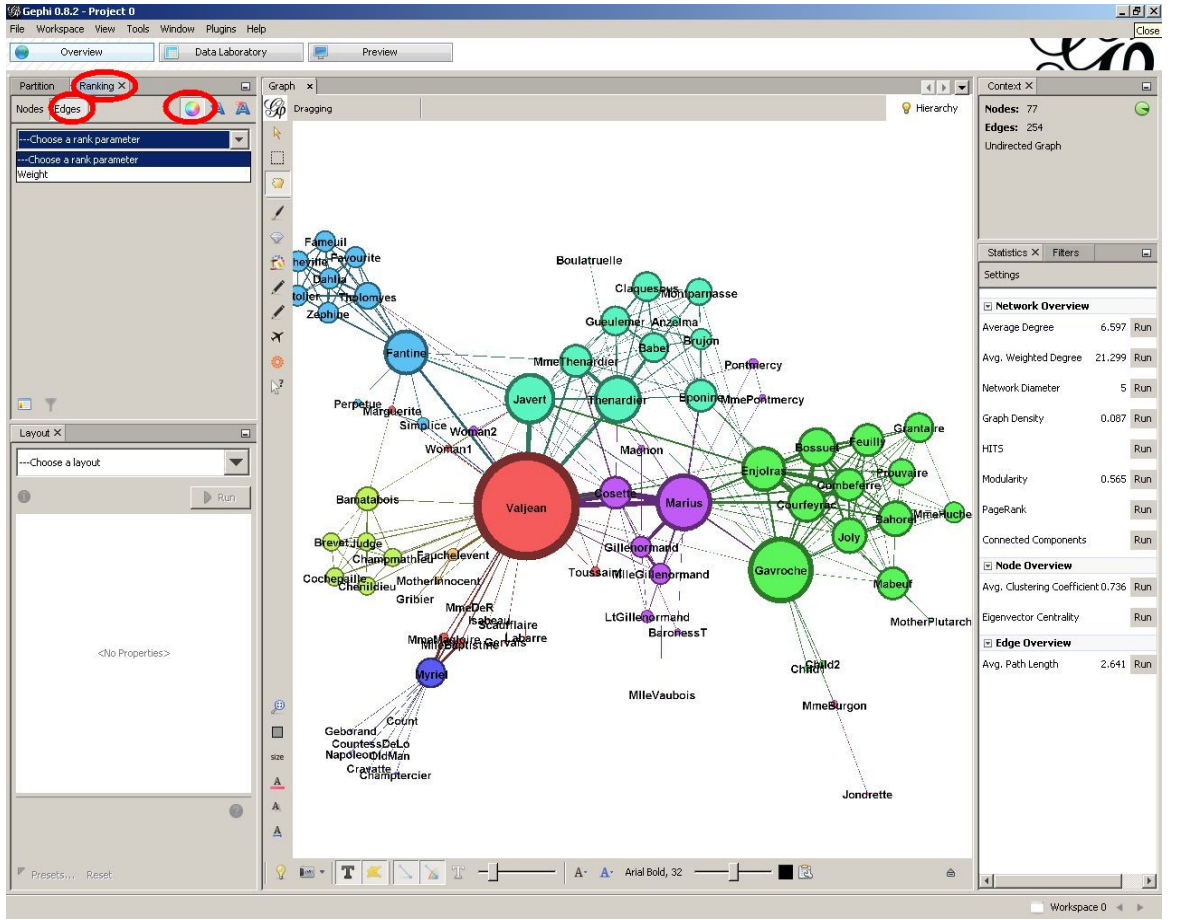
Eigenvector Centrality Run
Edge Overview
Avg. Path Length 2.641 Run
Layout
---Choose a layout
Run
<No Properties>
Presets... Reset
Arial Bold, 32
Workspace 0
Valjean
Marius
Javert
Fantine
Thenardier
Gavroche
Cosette
Enjolras
Myriel
Boulatruelle
MotherPlutarch
MlleVaubois
MmeBurgon
Jondrette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Avg. Path Length 2.641 Run
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<No Properties>
Presets... Reset
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Workspace 0
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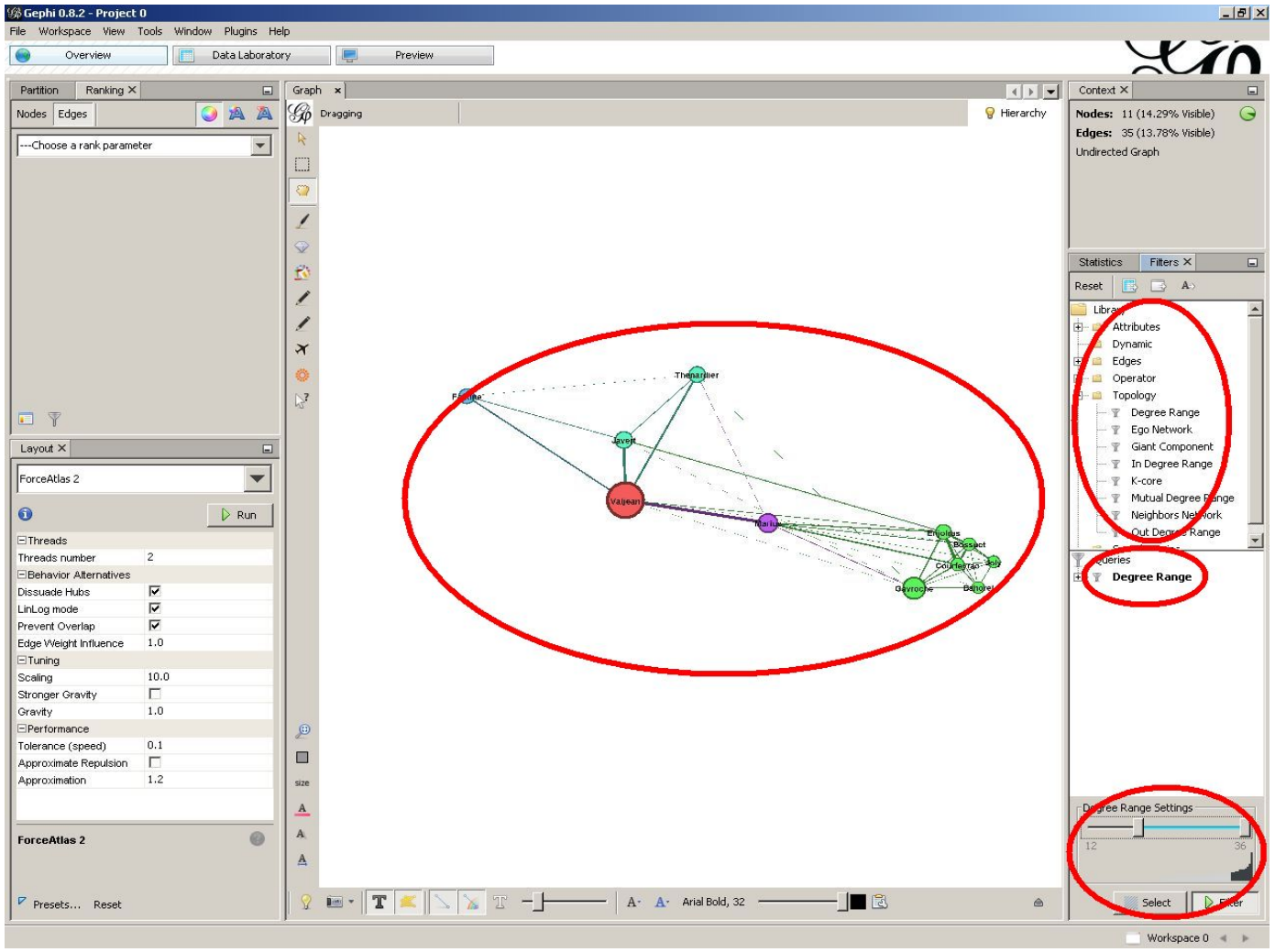
Myriel
Boulatruelle
MotherPlutarch
MlleVaubois
MmeBurgon
Jondrette

Filters


Gephi 0.8.2 - Project 0
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Data Laboratory
Preview
Partition
Ranking
Nodes
Edges
---Choose a rank parameter
Layout
ForceAtlas 2
Run
Threads
Threads number 2
Behavior Alternatives
Dissuade Hubs
LinLog mode
Prevent Overlap
Edge Weight Influence 1.0
Tuning
Scaling 10.0
Stronger Gravity
Gravity 1.0
Performance
Tolerance (speed) 0.1
Approximate Repulsion
Approximation 1.2
ForceAtlas 2
Presets... Reset
Graph
Dragging
Hierarchy
Arial Bold, 32
Context
Nodes: 11 (14.29% Visible)
Edges: 35 (13.78% Visible)
Undirected Graph
Statistics
Filters
Reset
Library
Attributes
Dynamic
Edges
Operator
Topology
Degree Range
Ego Network
Giant Component
In Degree Range
K-core
Mutual Degree Range
Neighbors Network
Out Degree Range
Queries
Degree Range
Degree Range Settings
12
36
Select
Filter
Workspace 0

Preview Window