Network Properties in Spark GraphFrames

Degree Distribution:

Scalar Free - If the gamma value lies between 2 and 3, then the graph is scalar free else it is not.

For Random graphs:

Gnm1.csv – γ=2.887. Thus, this graph is scale free.
Gnm2.cv – γ=9.621. Thus, this graph is not scale free.
Gnp1.csv – γ=54.582. Thus, this graph is not scale free.
Gnp2.csv – γ=4.939. Thus, this not scale free graph.

For Stanford Graphs:

amazon.graph.large: γ=1.326. Not a scale free graph
dblp.graph.large: γ=1.314. Not a scale free graph
youtube.graph.large: γ=1.561. Not a scale free graph
amazon.graph.small: γ=2.395. This graph is scale free.
dblp.graph.small: γ=1.608. Not a scale free graph
youtube.graph.small: γ=1.367. Not a scale free graph

Centrality:

Node Ranking:

	id	closeness
0	C	0.071429
1	F	0.071429
2	D	0.066667
3	H	0.066667
4	B	0.058824
5	E	0.058824
6	A	0.055556
7	G	0.055556
8	I	0.047619
9	J	0.034483

∵ F and C nodes have highest closeness values, machines at nodes F and C would be best candidates to hold the data.

Articulation Points:

We will choose all the nodes with the articulation point = 1 to break the connection in the terrorist network.

Thus, members whose articulation point is 1 should be targeted to best disrupt the communication in the organization.