Network Properties in Spark GraphFrames(Answer)

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Degree Distribution

1. All the random graphs are not scale free because they are not to follow the power law.

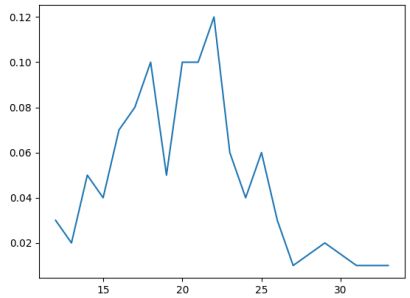

fig. gnm1

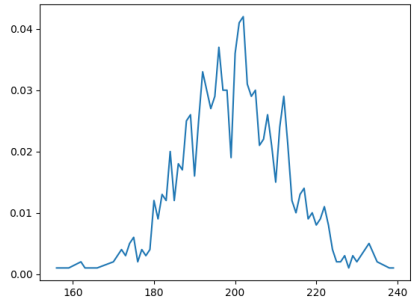

fig. gnm2

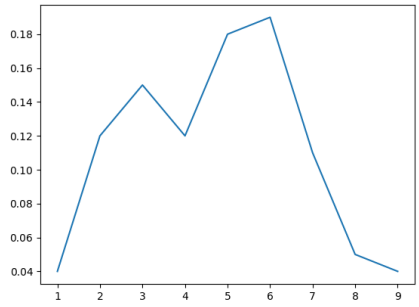

fig. gnp1

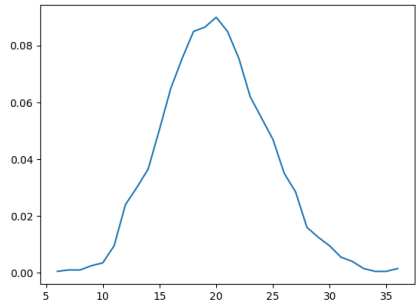

fig. gnp2

2. All Standford graphs follow the power law. So, all of them are scale free.

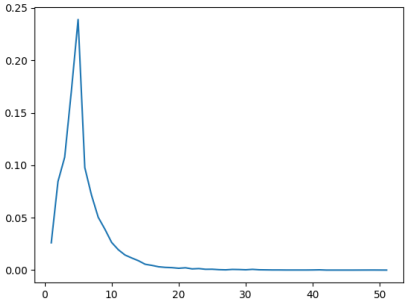

Fig. amazon.large

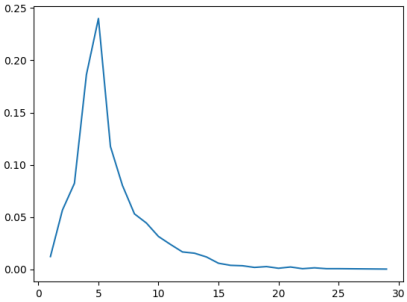

Fig. amazon.small

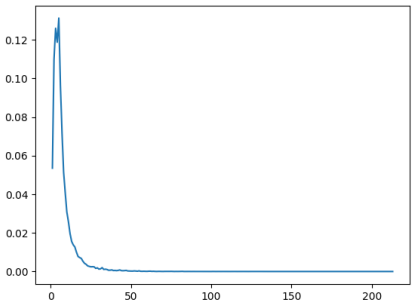

Fig. dblp.large

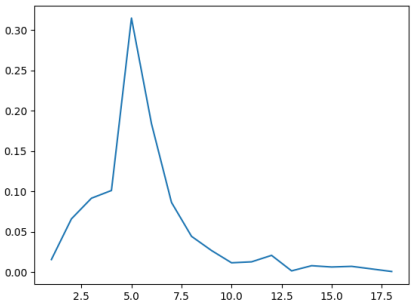

Fig. dblp.small

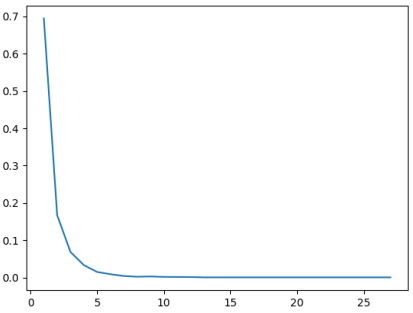

Fig. youtube.large

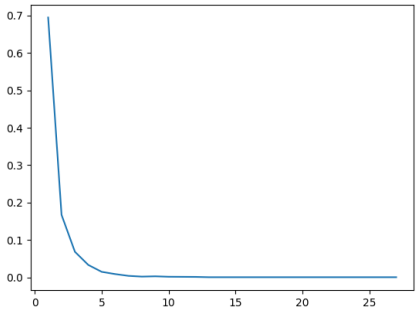

Fig.youtube.small

Centrality

1. The rand of nodes as below:

id	closeness
C	0.07142857142857142
F	0.07142857142857142
D	0.06666666666666667
H	0.06666666666666667
B	0.058823529411764705
E	0.058823529411764705
G	0.05555555555555555
A	0.05555555555555555
I	0.047619047619047616
J	0.034482758620689655

2. Node C and F will be the best options, since they have the highest rank of closeness centrality

Articulation Points

1. The members qualified for articulation points should have been targeted to best disrupt communication in the organization. The list as below:

Articulation points:

id	articulation
Mohamed Atta	1
Usman Bandukra	1
Mamoun Darkazanli	1
Essid Sami Ben Khemais	1
Djamal Beghal	1
Nawaf Alhazmi	1
Raed Hijazi	1