Name: Poorva N. Kulkarni
Student ID: 200312183
Project: Network Properties with Apache Spark

Degree:

1) Generate a few random graphs. Do the random graphs you tested appear to be scale free? (Include degree distribution with your answer).

   Power law is demonstrated by a function called powerLaw( ) written in degree.py which runs and produces plots named as <filename>.png

   The 4 random graphs which are generated are not scale free. Their degree distribution is included in their <filename>.csv added in the zip folder.
   GNM1
   GNM2
   GNP1
   GNP2

   Are all not scale free.

2) Do the Stanford graphs provided to you appear to be scale free?
   Amazon.graph.small – scale free
   Amazon.graph.large – scale free
   Youtube.graph.small - scale free
   Youtube.graph.large – not scale free
   Dblp.graph.small - scale free
   Dblp.graph.large – not scale free

Centrality:

1) Rank the nodes from highest to lowest closeness centrality, with their closeness values.
   Answer:
   F, C -> 0.071
   H, D -> 0.066
   B, E -> 0.058
   G, A -> 0.055
   I -> 0.0476
   J -> 0.0344

2) Which two machines would be the best candidates to hold this data based on other machines having few hops to access this data?

Answer: As they have the highest closeness centrality, nodes **C and F** would be the best candidates to hold data.

Articulation:

As the articulation points are those, which on removal cause separated components, the members targeted to disrupt communication are articulation points.

They are:

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