

## Degree Distribution

**Power Law** - I wrote a script `power_law.py` and fit the output of `degree.py` i.e. degree count and checked the value of Alpha in the fit model. If  $\alpha > 1$  the network is scale-free.

1. Tried creating 4 random graphs using NetworkX. None of them depicted power law.

(Theoretical\_CDF \* (1 - Theoretical\_CDF))  
2.88

(Theoretical\_CDF \* (1 - Theoretical\_CDF))  
9.62

(Theoretical\_CDF \* (1 - Theoretical\_CDF))  
4.93

(Theoretical\_CDF \* (1 - Theoretical\_CDF))  
54.58

2. Amazon.small 2.39 So it is scale-free.  
Amazon.large 2.74 So it is scale-free

Youtube.small 1.36 So it is scale-free  
Youtube.large 1.8 So it is scale-free

Dblp.small 1.60 So it is scale-free  
Dblp.large 1.50 So it is scale-free

## Centrality

Calculating closeness.

```
+---+-----+
| id|      closeness|
+---+-----+
| F| 0.07142857142857142|
| C| 0.07142857142857142|
| H| 0.06666666666666667|
| D| 0.06666666666666667|
| E| 0.058823529411764705|
| B| 0.058823529411764705|
| A| 0.05555555555555555|
| G| 0.05555555555555555|
| I| 0.047619047619047616|
```

| J|0.034482758620689655|  
+---+-----+

2 => Machine F and C would be the best.

### ArticulationPoints

Articulation points:

+-----+-----+

|id                   |articulation|

+-----+-----+

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