**Social Media Analysis Assignment**

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Video Link - <https://drive.google.com/drive/folders/1lkAGSMHtt-VwtVyYPiGCpiCbnd4tih6_?usp=sharing>

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| Property (a) — Number of nodes (n) | | | |
| Dataset 1 (15s.csv) | 145 | Dataset 2 (15.csv) | 1258 |
| ER Model | 145 | ER Model | 1258 |
| BA Model | 145 | BA Model | 1258 |
| Property (b) — Number of edges (m) | | | |
| Dataset 1 (15s.csv) | 2512 | Dataset 2 (15.csv) | 7682 |
| ER Model | 196 | ER Model | 15969 |
| BA Model | 1350 | BA Model | 12480 |
| Property (c) — Number of triangles | | | |
| Dataset 1 (15s.csv) | 88 | Dataset 2 (15.csv) | 548 |
| ER Model | 137 | ER Model | 1258 |
| BA Model | 145 | BA Model | 1258 |
| Property (d) — Maximum degree of a node | | | |
| Dataset 1 (15s.csv) | 78 | Dataset 2 (15.csv) | 253 |
| ER Model | 9 | ER Model | 41 |
| BA Model | 68 | BA Model | 172 |
| Property (e) — Average degree | | | |
| Dataset 1 (15s.csv) | 17.324 | Dataset 2 (15.csv) | 6.107 |
| ER Model | 1.431 | ER Model | 12.694 |
| BA Model | 9.310 | BA Model | 9.921 |
| Property (f) — Size of Largest connected component or Giant Component | | | |
| Dataset 1 (15s.csv) | 145 | Dataset 2 (15.csv) | 308 |
| ER Model | 8 | ER Model | 127 |
| BA Model | 15 | BA Model | 125 |
| Property (g) — Diameter | | | |
| Dataset 1 (15s.csv) | 6 | Dataset 2 (15.csv) | 15 |
| ER Model | 5 | ER Model | 11 |
| BA Model | 10 | BA Model | 14 |
| Property (h) — Power law exponent | | | |
| Dataset 1 (15s.csv) | 2.1 | Dataset 2 (15.csv) | 2.33 |
| Property (i) — Average Clustering coefficient | | | |
| Dataset 1 (15s.csv) | 0.393 | Dataset 2 (15.csv) | 0.038 |
| ER Model | 0.003 | ER Model | 0.01 |
| BA Model | 0.106 | BA Model | 0.026 |
| Property (j) — Algebraic Connectivity | | | |
| Dataset 1 (15s.csv) | 0.8475578 | Dataset 2 (15.csv) | 0.395625 |
| ER Model | 2.96919783 | ER Model | 8.3075925 |
| BA Model | 7.27700926 | BA Model | 7.4429649 |
| Property (k) — Average Path length | | | |
| Dataset 1 (15s.csv) | 2.020 | Dataset 2 (15.csv) | 6.002 |
| ER Model | 1.952 | ER Model | 3.137 |
| BA Model | 2.226 | BA Model | 3.380 |

Property (l) — Node betweenness distribution

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Property (m) — Edge betweenness distribution

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Property (n) — Dispersion with respect to each of the nodes’ degree i.e. Standard deviation

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Property (o) — Generate the degree distribution

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| --- | --- |
| Node Degrees | Node Degrees |

Property (m) — Visualize the Graph

Dataset1 – 15s.csv

Diagram

Description automatically generated

Dataset2 - 15.csv

A close up

Description automatically generated

Property (q) — Probability distribution for the length of the shortest paths pd with respect to d such that x-axis will be degree and it will vary as d=1,2,3,… and pd is to be calculated for each such shortest distance.

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| Chart, scatter chart  Description automatically generated | Chart, scatter chart  Description automatically generated |

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| Property (r) — Spectral Radius | | | |
| Dataset 1 (15s.csv) | 3 | Dataset 2 (15.csv) | 7.4 |
| ER Model | 2.5 | ER Model | 5.5 |
| BA Model | 5 | BA Model | 7 |
| Property (s) — Assortativity (determined with the help of Pearson Correlation Coefficient) | | | |
| Dataset 1 (15s.csv) | 0.2597 | Dataset 2 (15.csv) | -0.06 |
| ER Model | -0.1116 | ER Model | 0.00517 |
| BA Model | -0.0245 | BA Model | -0.0245 |