Weekly Update 4-6

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1. Weekly Progress

1.1. Creating Graphs

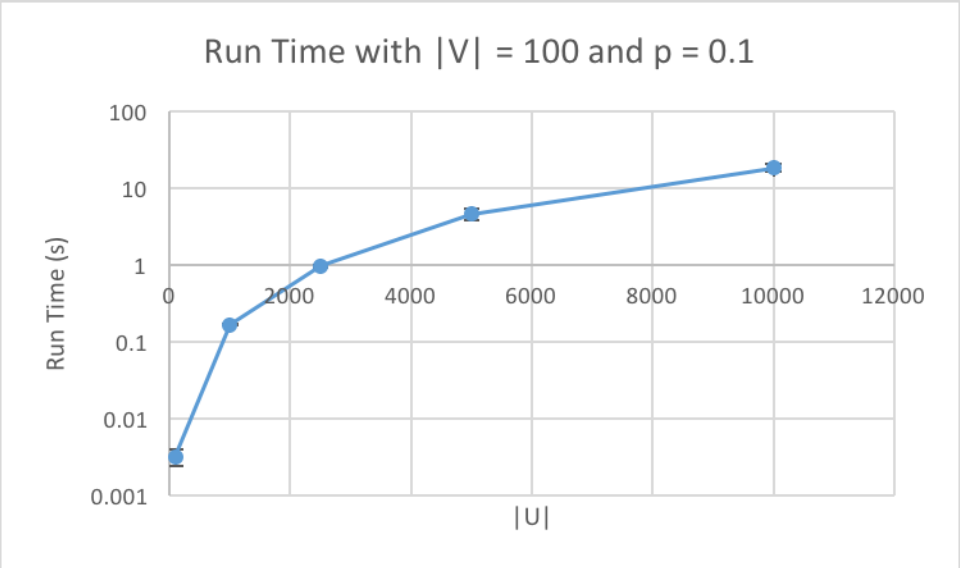
- Attempted to use BRITE Topology to create graphs, software did not work.
- Created a MATLAB program to create a bipartite graph and undirected graph
- Able to vary size of graphs and density
- Exports as a txt file

1.2. Finding Graphs Online

- Found Facebook data online
- Difficult to find corresponding bipartite/community information

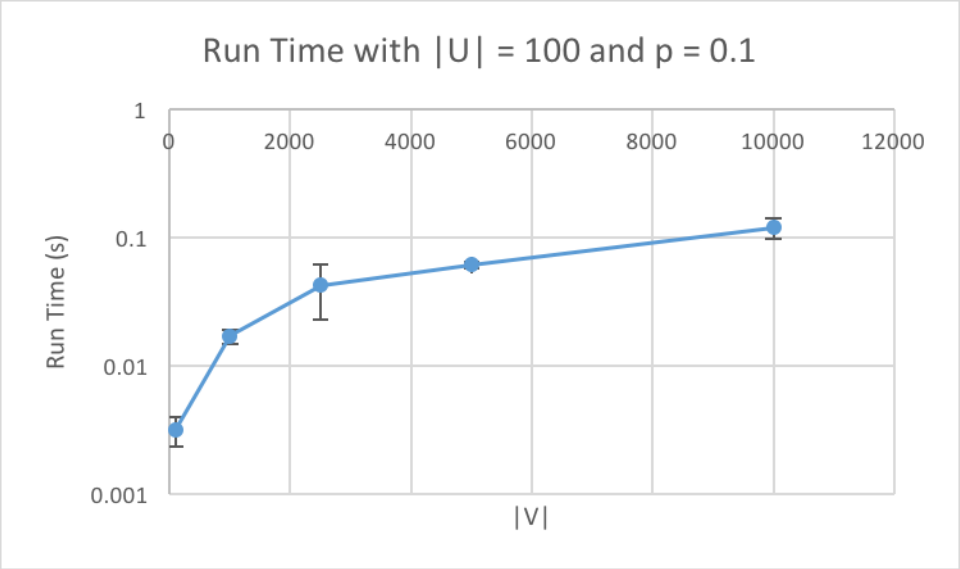
1.3. Gathering Data and Analyzing

- Tested various graph sizes and density and analyzed runtime
- Checked run times for $|U| = 100, 1000, 2500, 5000$, and 10000, $|V| = 100, 1000, 2500, 5000$, and 10000, and $p = 0.1, 0.2, 0.3, 0.4, 0.5$
- Graphed average run times for a sample size of 10
- Ran stats using SPSS
- Graph for various $|U|$ values



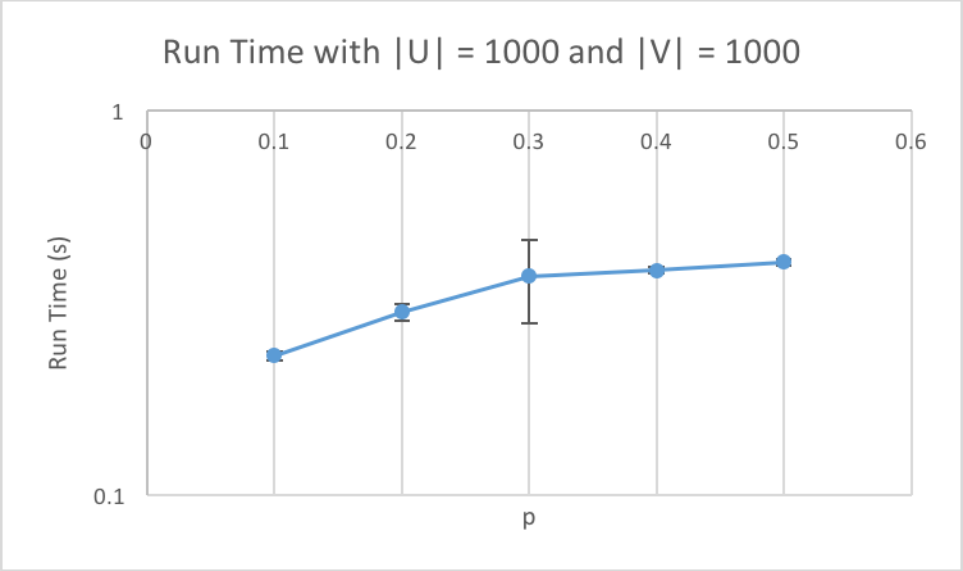
It can be seen that as the number of vertices in U increases, the run time increases exponentially. There is a significant difference ($p < 0.05$) in run time between each point.

- Graph for various $|V|$ values



It can be seen that as the number of vertices in V increases, the run time increases very slightly. There is a significant difference ($p < 0.05$) between $|V| = 100$, $|V| = 1000$, and $|V| = 10000$.

- Graph for various p values



It can be seen that as p increases, the run time increases very slightly again. There is a significant difference ($p < 0.05$) between $p = 0.1$, $p = 0.2$, and $p = 0.5$.

2. To-Do

☐ Continue to find better social network data