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CSC 403 W18

Overview: This experiment was designed to test the relationship between a value of probability and the size of the largest component in undirected and directed graphs.

Observations:

The rate of component size increase as the probability increased was close to the same for both graph types.

All vertices were connected when p was around .053 for both graph types.

Vertices coalesce into connected components at low levels of p (probability).

Directed Graph: Rate of increase was most extreme from p .01 to .022

Undirected Graph: Rate of increase was most extreme from p .01 to .019

Testing Setup: A modified version of Riely’s CC.java, KosarajuSharirSCC.java, and GraphGenerator.java packages were used to facilitate the testing. Averages of largest connected component sizes were generated from 1000 test runs of 100 vertices for each directed and undirected graphs using the erRandom function.

CC.java : added biggestCcSize function to return largest connected component size. Added loops to get the average of 1000 tests for V of size 100

KosarajuSharirSCC.java: added ccMaxNumber function to return largest strongly connected component size. Added loops to get the average of 1000 tests for V of size 100

GraphGenerator.java: added 2 functions erRandom and erRandomDi to generate the graphs