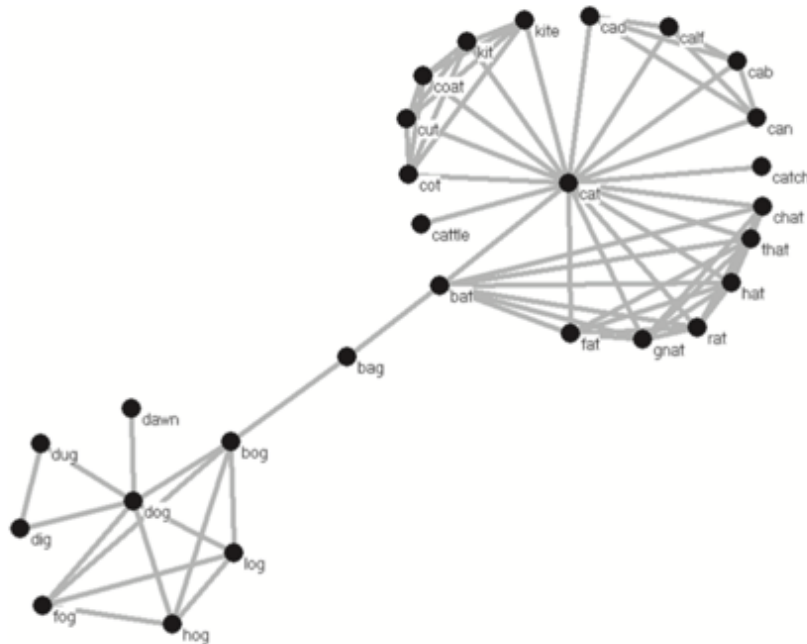


## Homework 1 – A phonological network

John Alderete, Language Network Science, Simon Fraser University

Create an undirected network for the Vitevitch phonological network shown below. This network is encoded with the adjacency list <vitevitch.adjlist> in the Data sets folder (also given at the end of this document). After creating the undirected network, answer the questions below.



Write a short paragraph describing the phonological network with the measures and concepts you are familiar with. What is the total number of nodes and edges? What is the total number of possible edges (given the nodes), and use this to describe the density of the network. What is the average degree of the network, and which nodes have the highest and lowest degree?

Then write a short paragraph about your expectations about how the words corresponding to these nodes will be processed by humans. Recall that words with many neighbours are processed differently than words with fewer neighbours: in picture-naming experiments, for example, people take more time to recognize words with many neighbors. Use the facts of the network to make some concrete predictions.

Adjacent list in <vitevitch.adjlist>

bog dog fog log hog bag

log bog dog fog hog

hog log bog dog fog

fog dog bog log hog

dig dog dug

dug dog dig

dawn dog

dog dawn dug dig fog hog log bog

bag bog bat

cattle cat

cot cat kite kit coat cut

cut cot cat kite kit coat

coat cut cot cat kite kit

kit kite cat cot cut coat

kite cat cot cut coat kit

cad cat calf cab can

calf cad cat cab can

cab calf cad cat can

can cat cab calf cad

catch cat

chat cat that hat rat gnat fat

that chat cat hat rat gnat fat

hat rat gnat fat cat chat that

rat gnat fat cat chat that hat

gnat fat cat chat that hat rat

fat cat chat that hat rat gnat

cat chat that hat rat gnat fat bat cattle cot cut coat kit kite cad calf cab calf cab can catch