Word Ladders Report

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Result

Our implementation produces the expected results on all input-output file pars, except words-50.txt, which did not have any connection. The dataset provided did not seem to have any path connecting with any of the other provided datasets

On input words-5757.txt, a shortest path from aargh to zombi of length 4 is the following
aargh → graph → parch → chard → hoard → radon → nomad → dogma → amigo → gizmo
→ zombi

Implementation details:

We build the graph's edge by iterating over all five-letter words in a bag and creates an edge between a five-letter word that matches the key by its last four letters. Note that we also use a hashtable which maps an integer for each five letter words, since diagraph.addEdge() and breadthFirstDirectedPaths.pathTo() takes an integer as input. The integer represents word word as vertex.

The running time for graph construction is $O((5757^3 + \log^2 82899)\cos 5)$.
The total running time of our implementation (including construction and traversal) is O(n+m+m) = O(n+2M) = O(5757+2*89899)