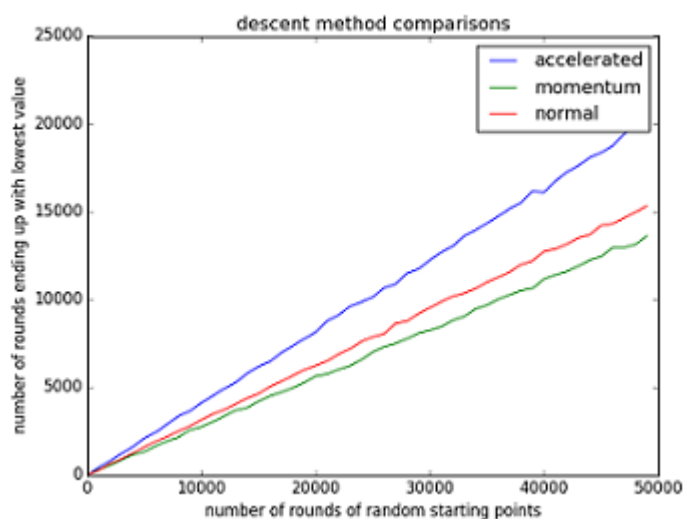


CS270 – Spring 2017 — Project Summary

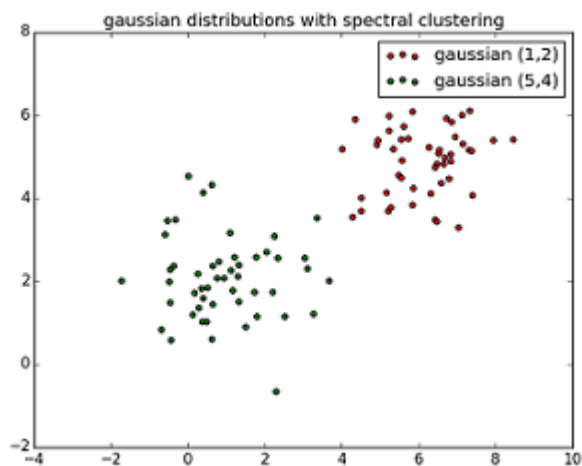
Brian Lei and Jason Kha

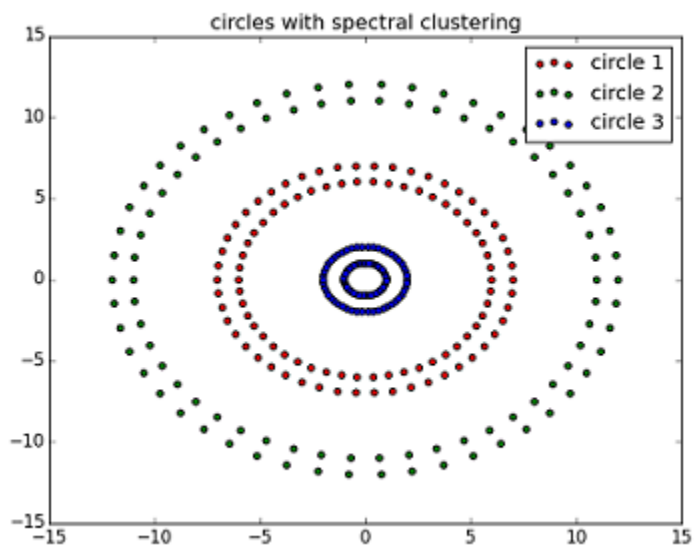
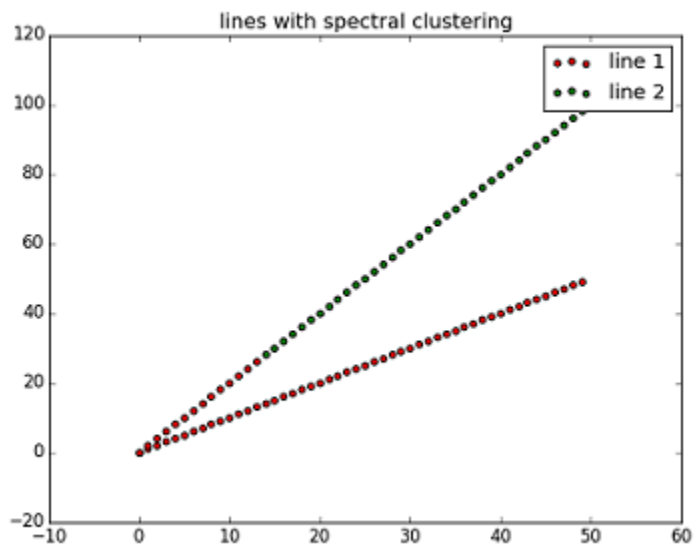
1. Cool Machine Learning Algorithms

Brian implemented accelerated gradient descent. He included some comments in his code and found that accelerated gradient descent ended up at the lowest value out of accelerated, normal, and momentum descent for the most rounds. A plot comparing the three methods is below.



Brian also implemented spectral clustering and made some visualizations, shown below.



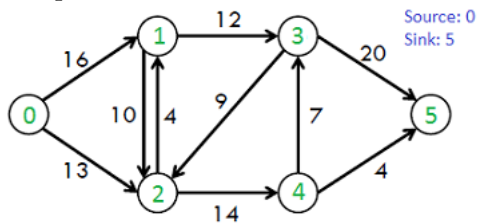


2. Rao-Goldberg and Dinic's Algorithm

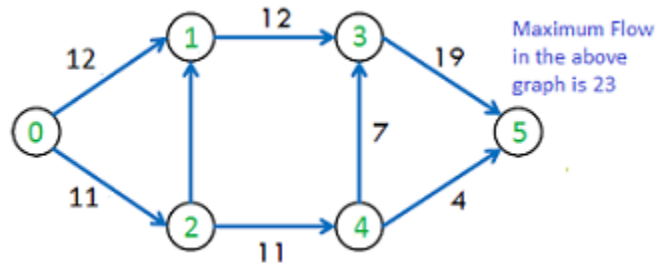
Jason implemented the Rao-Goldberg algorithm and Dinic's algorithm for max flow in rao.py. He included some comments in his code describing how he implemented each step in Rao-Goldberg. To gain a better understanding of Rao-Goldberg, Jason did some research on Dinic's blocking max flow algorithm and borrowed an implementation from: <http://www.geeksforgeeks.org/dinics-algorithm-maximum-flow/>. He translated the C++ code they provided into Python, and then tried to apply concepts of blocking flow he learned from reading and coding Dinic's algorithm in his implementation of Rao-Goldberg. For Rao-Goldberg, Jason also used the notes and pseudocode from <http://cs.ucls.uchicago.edu/~rahulmehta/papers/GoldbergRao-Notes.pdf>.

Jason tested his implementation of Rao-Goldberg and Dinic on two example graphs found on the internet, and he got the correct max flows and flow matrices for both. Here are the graphs and max flows for the two examples.

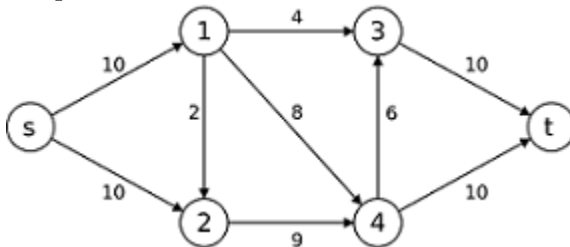
Graph 1



Max flow of Graph 1: 23



Graph 2



Max flow of Graph 2: 19

