

Kevin Conte

AMATH 584

Hw 5 Writeup

1a. This was pretty straight forward, unless I did it wrong, which is entirely probable. The ground truth values were listed in order.

1b. Using the power iteration method provided a swifter method of finding the largest eigenvalues. I began using 10 iterations and the eigenvalue was accurate to four or five decimal places. I then iterated 100 times and it took around ninety more iterations to gain two more decimals places of accuracy. So this method is pretty accurate with low iterations and gains slightly more accuracy with many more. I was going to copy and paste the outputs in this writeup, but it became 55 pages long and that felt like too much.

1c. My guesses for this part were completely random because I do not have enough of an understanding of linear algebra to make informed guesses. The method becomes more accurate with more iterations.

1d. I'm not sure this part needs a writeup, the output of the code show what needs to be shown.

2a. The power iteration method obtained fairly accurate eigenvalues/vectors, when compared to the outputs of the SVD.

2b. The randomized sampling was able to mimic the SVD outputs pretty well.

2c. As the number of randomized samples approached the amount of data points, the accuracy approached one hundred percent, but a small number of samples, around ten or twenty, was able to portray the data accurately enough.