# Eigenproblems Lab Report

## Testing of the Implementation

To test my implementations of the power\_method, deflate, CenterMatrix, and CovarianceMatrix functions, I made use of the provided asserts, and modified them to compare with some simple calculations done by hand. While not extensive, this testing confirmed the basic functionality for matrices of different sizes, which was my main concern.

## Principle Component Analysis

As part of the Principle Component Analysis, I calculated the eigenvectors and their corresponding values, and produced an explained variance ratio plot. From this plot we can see that by the 5th component more than 99% of the variance is explained, therefore five principle components should be used.



Based on these graphs we can see that a good pair of eigenvectors is the first and third eigenvectors.

## Dimensionality Reduction

For this analysis I chose row 10 and row 40. The graphs produced are as follows.

