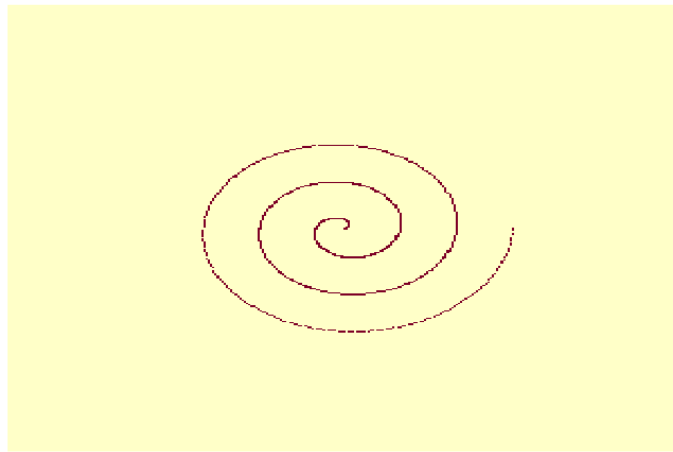


# Image Compression

Zach Fuller

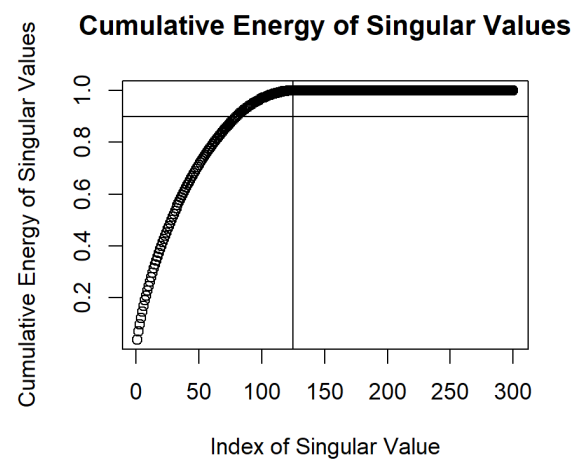
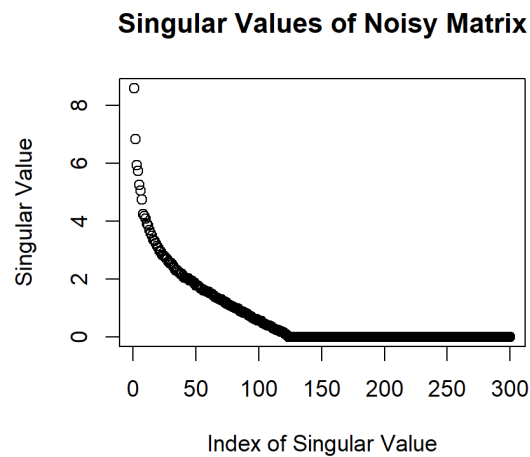
This project demonstrates how images can be compressed using SVD and thresholding. The associated R file has functions to simplify the process for anyone interested in repeating this process.

## Original



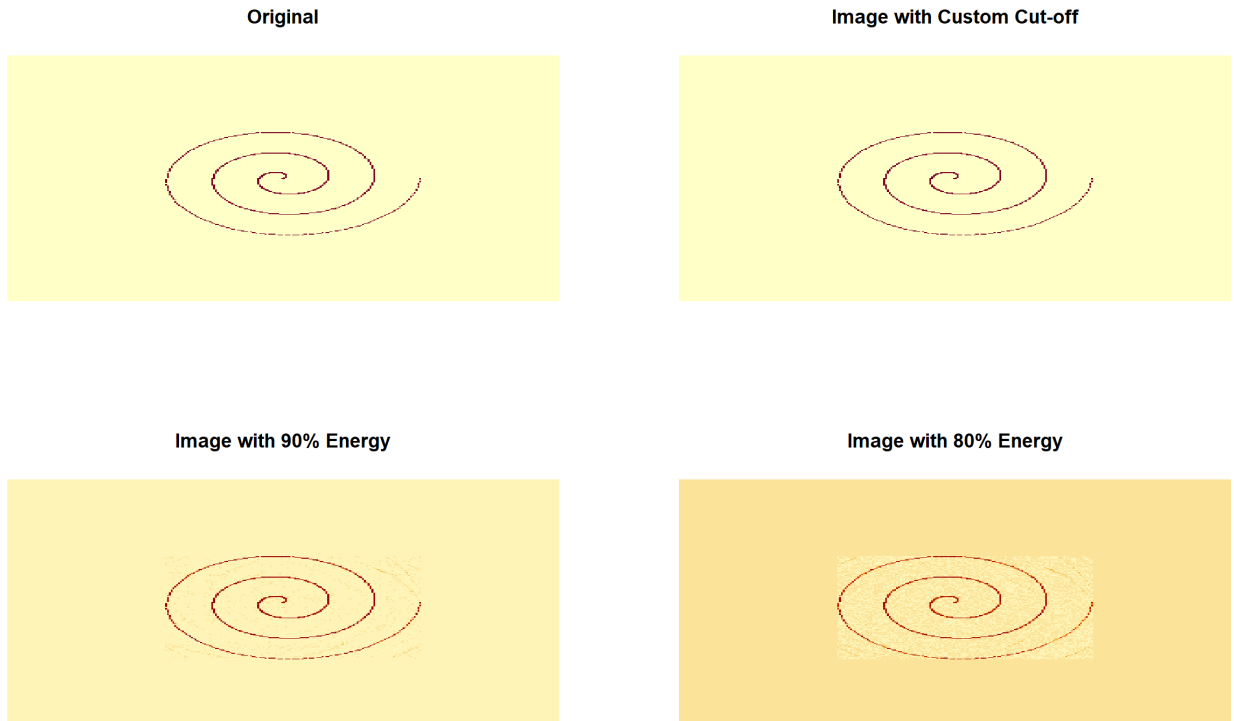
## Image Processing

The first step is to calculate the singular value decomposition (SVD). From here it is useful to get an idea of how much information each singular value contributes to the image.



In the Cumulative Energy graph, the horizontal line represents 90% of the total energy in the image matrix. The vertical line represents a visual cut-off that I believe is appropriate for this problem.

## Compressed Images



The custom cut-off performs quite well here and significantly reduces the number of singular values needed.

Image	Singular Values	Error (How different the images are.)
Original	300	0
Custom	125	3.552866e-32
90% Energy	81	0.0001548987
80% Energy	62	0.0004721139

I am currently working on a project to improve the resolution of images using SVD and hope to post it soon!

