

CS251 Proj6

CS251 Project 6 - Principal Component Analysis

The main goal of this project was to implement the capability of PCA on a data set and producing the result visually. The first part of the project required us to construct a PCaData class as a child class of Data class. Then, the bulk of this project was to then also incorporate all of these capabilities into our GUI.

PCA Data Class:

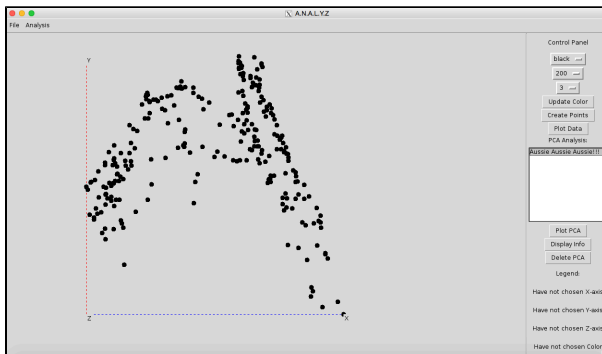
First, we created this PCADData class. I constructed it as its own class that inherits Data.py. This class accepts PCA data and stores it. Next, we had to implement a `pca()` method in our analysis to actually handle the real calculations of Principal Component Analysis. The `pca()` method helps calculate our eigenvector, eigenvalues, and our projected data points. After the test files and test data from our Lab 6 were all running correctly, the rest of the project basically entailed implementing PCA into our GUI.

GUI Implementation:

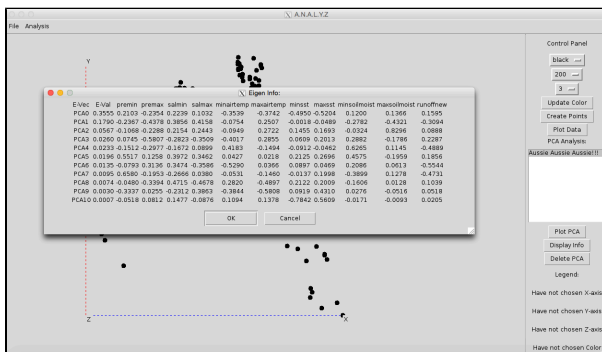
The first thing I focused on was constructing a method in my display.py class similar to buildPoints() called buildPCA(). BuildPCA takes in the headers and the PCAData, normalizes the data, and just like buildPoints allows the my program to display the PCA data nicely. Then, I created handlePCA to compliment buildPCA, just like we have in the past. Other than that, I created a few DialogBoxes and a ListBox to allow the user to select the appropriate headers. Also, I had to implement a some tk-Button to allow the user to execute multiple actions once the PCA data was ready to be used. The three buttons were Plot PCA, PCA Info, and Delete PCA. These all corresponded to the methods: handlePCAplot which plots the PCA data points, handlePCAinfo which generates the DialogBox of EigenTable values, and handlePCAdelete which simply deletes the PCA. Finally, I named my project "A.N.A.L.Y.Z " to stand for. Analyze Numbers And Love Yourself, Zealously! Lol... In times of dire stress from schoolwork piling on top of you, it is important to really love yourself, zealously.... I never said I was funny Torrie :P

Australian Coast Data Screenshots:

Here is the Australian Data and it projected correctly!



And here is my EigenTabel with the correct values!

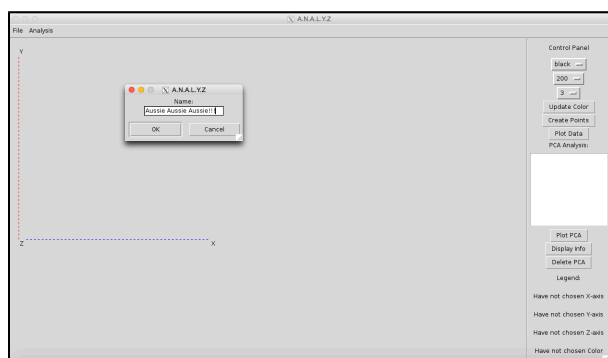


...apologies about the small pictures, if you zoom in you can see its all correct!

Extensions:

I did an extension to allow the user to give the PCA data file a name before adding it to the PCA box on the display. If the user is lazy and doesn't want to name it, "PCA" is the default name.

Here is the little name dialog box that pops up!: (zoom in for laugh)



Who helped me:

This week I got ALOT of help from CP Majgaard and met with Stephanie a few times. In addition, I worked closely with Steve Parrott(like always), Brendan Doyle and Julia Saul(like almost always).