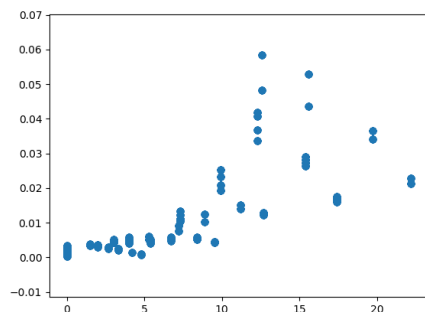


```

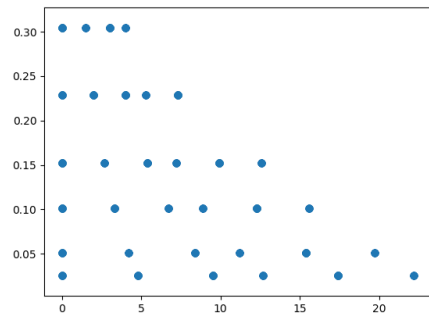
Enter Data File: airfoil_self_noise.dat
Enter epsilon: 0.0001
Mean: [2.88638057e+03 6.78230206e+00 1.36548237e-01 5.08607452e+01
1.11398804e-02 1.24835943e+02]
Total Variance: 9932429.717196051
Inner Covariance [[ 1.49279535e+10 -7.64376578e+06 -1.62140959e+03 9.85633095e+06
-1.43284459e+04 -1.27630870e+07]
[-7.64376578e+06 5.26064092e+04 -4.19790897e+02 8.13390582e+03
8.80663138e+01 -9.57288132e+03]
[-1.62140959e+03 -4.19790897e+02 1.31423015e+01 8.28494597e+00
-4.08024920e-01 -2.28899229e+02]
[ 9.85633095e+06 8.13390582e+03 8.28494597e+00 3.64252444e+05
-1.22235963e+00 2.01868132e+04]
[-1.43284459e+04 8.80663138e+01 -4.08024920e-01 -1.22235963e+00
2.59738849e-01 -4.26043044e+01]
[-1.27630870e+07 -9.57288132e+03 -2.28899229e+02 2.01868132e+04
-4.26043044e+01 7.14823777e+04]]
Outer Covariance [[ 9.93210480e+06 -5.08567251e+03 -1.07878216e+00 6.55777176e+03
-9.53323084e+00 -8.49174115e+03]
[-5.08567251e+03 3.50009376e+01 -2.79301994e-01 5.41178032e+00
5.85936885e-02 -6.36918252e+00]
[-1.07878216e+00 -2.79301994e-01 8.74404626e-03 5.51227277e-03
-2.71473666e-04 -1.52294896e-01]
[ 6.55777176e+03 5.41178032e+00 5.51227277e-03 2.42350262e+02
-8.13279857e-04 1.34310135e+01]
[-9.53323084e+00 5.85936885e-02 -2.71473666e-04 -8.13279857e-04
1.72813606e-04 -2.83461772e-02]
[-8.49174115e+03 -6.36918252e+00 -1.52294896e-01 1.34310135e+01
-2.83461772e-02 4.75597989e+01]]
Correlation [[ 1. -0.27276454 -0.00366064 0.13366383 -0.23010735 -0.39071141]
[-0.27276454 1. -0.50486815 0.05875957 0.75339378 -0.15610753]
[ 0.00366064 -0.50486815 1. 0.00378663 -0.22084243 -0.23616151]
[ 0.13366383 0.05875957 0.00378663 1. -0.00397401 0.1251028 ]
[-0.23010735 0.75339378 -0.22084243 -0.00397401 1. -0.31266951]
[-0.39071141 -0.15610753 -0.23616151 0.1251028 -0.31266951 1. ]]

```

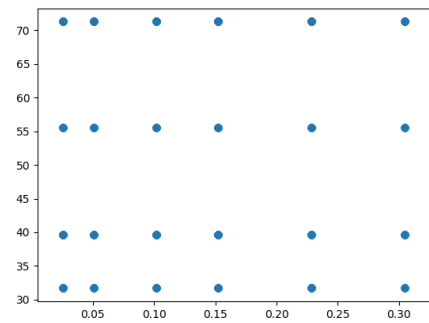
The correlation between variables 1 and variable 4 (0-indexed) is 0.75. This indicates a positive relationship. We see that in the following scatterplot as an increase in one corresponds to an increase in the other.



The correlation between variables 1 and variable 2 (0-indexed) is -0.5. This indicates a negative relationship. We see that in the following scatterplot as an increase in one corresponds to a decrease in the other.



The correlation between variables 2 and variable 3 (0-indexed) is 0.003. This indicates no relationship. We see that in the following scatterplot as an increase in one has no impact on the other.



Dominant Eigenvector: [9.99998571e-01 -5.12043187e-04 -1.08587623e-07 6.60273467e-04
-9.59837814e-07 -8.54979374e-04]
Projection: [799.9380349 999.93860405 1249.93760553 ... 3999.9212981 4999.92019385
6299.92006303]