Linear Data Analysis
Week 9 Tutorial

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March 8, 2022

Fun Pre-Notes

we used to tell time from our pocket (pocket watch). 50 years ago we told time on our watch. Now, we tell time from our pocket again (smart phones). Also, were probably gunna have to use masks for the rest of our lives...

Home Work Assignment for This Week

for 2D data, PCA finds the elipsoid of best fit for the given data.
you can get all the data that matches a certain condition like so:

```
X1 = X(y < 0, :)
```

This puts all the rows of `X` less than 0 into the rows of `X1`
a scatter matrix is $S = M^\top M$

Note, a column is always a variable. A row is always a observation. If this is not the case; transpose.

Magic EigenValue Incantation

After finding the Eigenvalues of a Matrix.
After finding the eigenvalues & vectors we should:

1. sort the raw eigenvalues in descending order:
   `[lvec ndx] = sort(diag(lraw), descend)`
2. Permute the eigenvectors:
   `Emat = Eraw(:, ndx)/norm(Eraw, 'fro')`