Day 26

Principal Components

- 1. Given data matrix X with N rows (samples) and k columns (features) assume each feature has mean zero.
- 2. The matrix $Q=\frac{1}{N}X^\intercal X$ is symmetric and its entries are the variances/covariances.
- 3. If v is a vector, then Xv is called a "score" a synthetic measure of the data
- 4. The variance of the score is $v^{\intercal}Qv$.
- 5. Critical points of variance are eigenvectors of Q.
- 6. These critical directions are called "principal components".