

QR Factorization

Orthonormal Basis

If vectors have unit lengths they are orthonormal.

To find the orthonormal basis of \vec{v} , \hat{v}

$$\hat{v} = \frac{1}{\|\vec{v}\|} \vec{v}$$

QR Factorization

For a $m \times n$ matrix A linearly independent columns,

$$A = QR$$

Q is an $m \times n$, with columns are an orthonormal basis for $\text{Col}A$.

R is $n \times n$, upper triangular, with positive entries on its diagonal.