Eigenanalysis

- What's Eigenanalysis?
- Fourier's Eigenanalysis Model is a Replacement Process
- Powers and Fourier's Model
- Differential Equations and Fourier's Model
- Fourier's model illustrated
- What is Eigenanalysis? What's an Eigenvalue? What's an Eigenvector?
- Data Conversion Example
- History of Fourier's Model
- Determining Equations

What's Eigenanalysis?

Matrix eigenanalysis is a computational theory for the matrix equation

$$\mathbf{y} = A\mathbf{x}.$$

Fourier's Eigenanalysis Model

For exposition purposes, we assume A is a 3×3 matrix.

$$
\begin{aligned}
\mathbf{x} &= c_1\mathbf{v}_1 + c_2\mathbf{v}_2 + c_3\mathbf{v}_3 \text{ implies} \\
\mathbf{y} &= A\mathbf{x} \\
&= c_1\lambda_1\mathbf{v}_1 + c_2\lambda_2\mathbf{v}_2 + c_3\lambda_3\mathbf{v}_3.
\end{aligned}
\tag{1}
$$

Eigenanalysis Notation

The scale factors λ_1, λ_2, λ_3 and independent vectors $\mathbf{v}_1$, $\mathbf{v}_2$, $\mathbf{v}_3$ depend only on A. Symbols c_1, c_2, c_3 stand for arbitrary numbers. This implies variable $\mathbf{x}$ exhausts all possible 3-vectors in R^3.