



## Matrix Similarity

### 1 Why

TODO

### 2 Definition

A first square matrix is *similar* to a second square matrix if there exists a nonsingular matrix such that the first matrix is identical to the product of the inverse of the nonsingular matrix the second square matrix and the nonsingular matrix.

#### 2.1 Notation

Let  $A, B \in \mathbf{R}^{n \times n}$ .  $B$  is similar to  $A$  if there exists a nonsingular matrix  $S \in \mathbf{R}^{n \times n}$  such that

$$B = S^{-1}AS.$$

### 3 Equivalence Relation

**Proposition 1.** *Similarity is an equivalence relation.*