Span

1 Why

We want to convert a subset of a vector space into a subspace.

2 Definition

The *span* of a subset of a vector space is the intersection of all subspaces which contain that subset. Since the intersection of a family of subspaces is a subspace, so too is the span.

A subset of a vector space *spans* a subspace if its span is that subspace. For example, the subspace may be a vector space, in which case the subset spans the entire space.

2.1 Notation

We denote

3 Examples

Proposition 1. *The empty set is contained in every subspace, so the span of the empty set is the zero vector space.*

If S is a